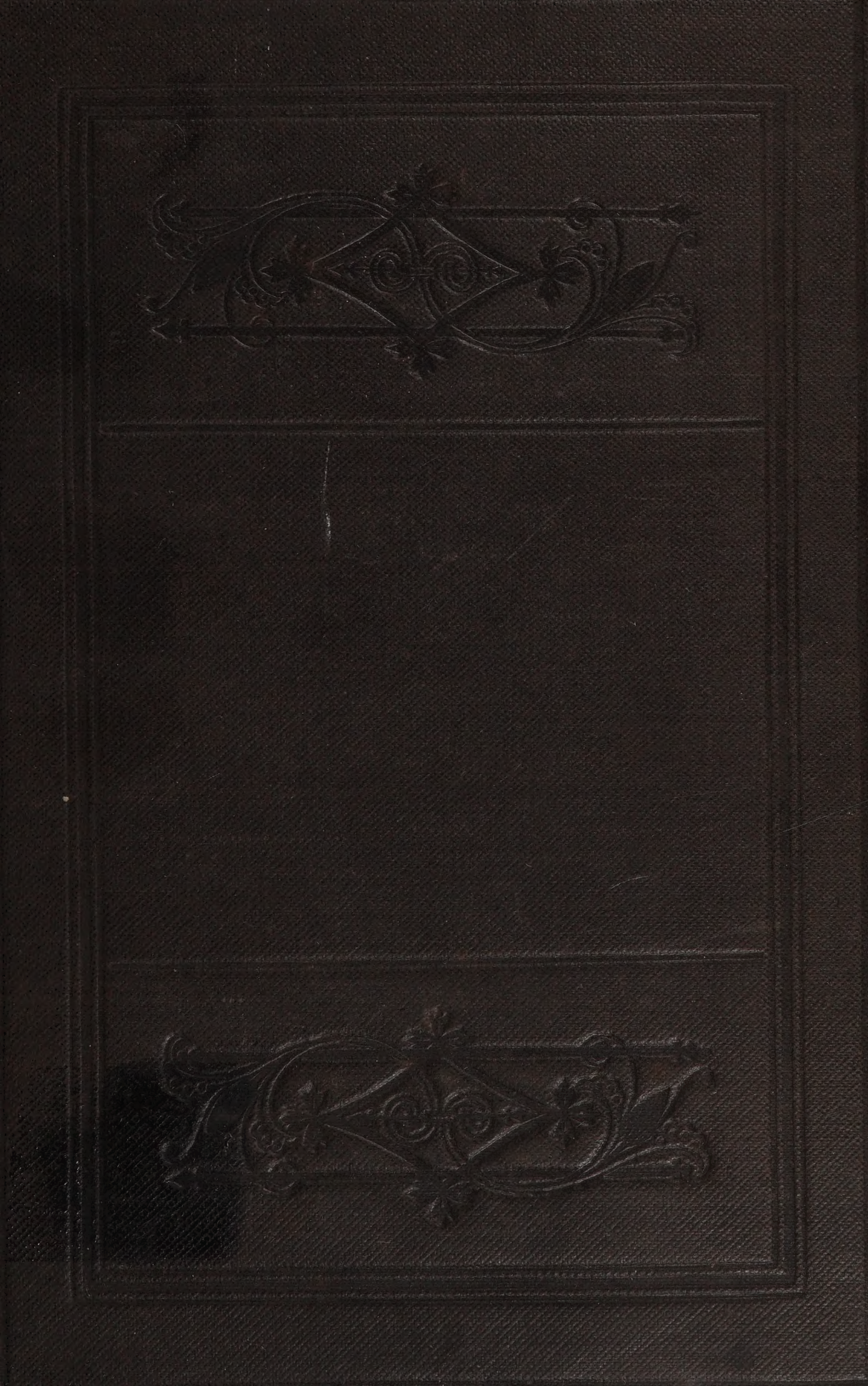

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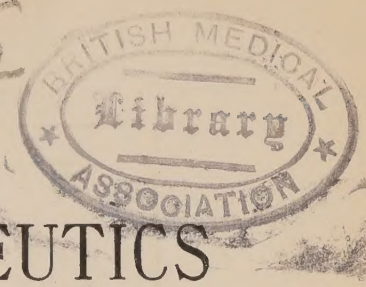

A MANUAL

OF

PRACTICAL THERAPEUTICS

CONSIDERED WITH REFERENCE TO

ARTICLES OF THE MATERIA MEDICA

BY

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This Volume is Dedicated

WITH THE SINCERE HOPE THAT

AMIDST THE EVER-VARYING CIRCUMSTANCES OF THEIR INDIAN CAREER

IT MAY AFFORD SOME HINTS AND SUGGESTIONS

TENDING TO THE ALLEVIATION AND BENEFIT OF THOSE

WHO MAY BE PLACED

UNDER THEIR CHARGE

PREFACE.

During the two-and-thirty years which have elapsed since the First Edition of this Manual made its appearance, Therapeutics both in theory and practice have undergone many important changes, and advanced with rapid strides in common with other branches of Medical Science. These have been set forth in each successive Edition, bringing the information in each case as far as possible up to date. In order to accomplish this without unduly increasing the size of the volume, much matter contained in each preceding Edition had to be curtailed, or omitted altogether, this involving the necessity of re-writing the greater portion of the volume.

In the present issue, the same mode of procedure has been followed out. In order to obtain space for even brief notices of the vast array of new remedies which have of late years been introduced into practice, to notice even concisely the novel and extended uses to which time-honoured and established remedies have been applied, and to incorporate the principal changes made in the British Pharmacopœia of 1885, it has been found necessary to omit Part II., so far as classes of Medicine are concerned, and other portions of the same part which it seemed desirable to retain, have been transferred to the body of the work, thus, stimulants have been transferred to Alcohol, Anæsthetics to Chloroform, and Blisters to Cantharides.

In addition to this, it was found necessary to omit a few minor articles which are of little or no value as therapeutic agents.

By these changes it is confidently hoped that the practical

usefulness of the work, so far from being diminished, will be found to be materially increased.

The work of revision was commenced single-handed, and was thus carried out, as far as the article Quinine, when the infirmities of advancing years, notably decreasing powers of vision, from cataract, obliged me to desist. Under these circumstances I consulted Dr. Murrell, one of the leading therapeutists of the day, in the hope that he would give me the benefit of his services as Editor. His professional engagements, however, preventing him from meeting my wishes, he referred me to Dr. Dudley W. Buxton, Assistant to the Professor of Medicine at the University College, London, as eminently calculated by his professional ability and soundness of judgment to fill that responsible post. To him consequently was entrusted the completion of the work, with general instructions to bring the contents up to date, and at the same time materially to reduce the bulk of the volume, a task requiring no little tact and judgment. By judicious curtailment of old matter he has found space for notices of the principal "New Remedies" which of late years have found favour in the sight of the Profession. In addition to these, Dr. Buxton has contributed more extended articles on Mineral Waters, Malt, Pepsin and Peptonized foods, Oleic Acid and the Oleates, Salicylic Acid and the Salicylates, Nitroglycerine, the Nitrites and Sulphites, &c. These contributions cannot well fail to give an increased value and interest to this Edition.

With these few preparatory remarks I issue for the fourth time my Manual of Practical Therapeutics, trusting that it may meet with the same favourable reception at the hands of the Profession as its predecessors have done.

That it may prove widely and increasingly useful, is my highest aspiration.

E. J. W.

London, *March* 1886.

INTRODUCTION.

THERAPEUTICS—a term derived from *θεραπεύω*, "I cure"—is taken to include the application of healing agents to the alleviation, cure, or prevention of disease.

There are very numerous mineral, vegetable, and animal products which are made use of by the therapeutist, and it becomes requisite that he should be familiar with the source and physical properties of these substances. It is, then, Materia Medica which teaches him the facts concerning these substances, while Pharmacy becomes requisite when he seeks to prepare from the raw material, preparations suitable for various remedial purposes. And thus, while Materia Medica and Pharmacy are necessary to the expert employment of drugs to the healing of disease, we yet find a further study—viz., Pharmacology—becomes requisite before the therapeutist can be said to be fully prepared for his work. Pharmacology, as defined by Lauder Brunton, comprises a knowledge of the action upon the body, or upon various portions of the body, of agents employed in the treatment of disease. Thus pharmacology may be taken as a knowledge of the physiological action of agents used in the treatment of disease—*i.e.*, their action upon the healthy organism—while therapeutics comprehends the knowledge of how such agents react upon diseased organs, and so guides us in applying appropriate remedies for given diseases.

From what goes above it will readily be seen that no exact therapeutic applications can be practised without a full comprehension having been arrived at of what nature the morbid changes are which it is proposed to remedy. Pathology here comes to our aid, and, by presenting to us the physiology of disease, enables us to apply our pharmacological knowledge—in fact, to practise rational therapeutics. In all cases when disease claims therapeutic assistance, it becomes necessary, first, to carefully study the train of morbid changes which either have taken place or which will result from antecedent lesions. The exact practice of therapeutics is, however, not always possible. In many cases we are wholly unable to trace the pathology of the disease, or can, at best, only find anatomical lesions, while we search in vain for the delicate chemico-physical workings which during life have been instru-

mental in bringing these about. And, again, it only too frequently happens that, when our pathology indicates with perspicuity the morbid bias of the organism, we are at fault when we seek for a remedy applicable to cure the diseased state. Were therapeutics restricted to the cases in which we clearly understand the pathological departures, and in which we have medicines competent to cope with and cure the disease, it would be indeed a small science, and as hopeless as small.

In point of fact, therapeutics holds a much wider range of utility. Thus, while therapeutic agents may fail to cure organic disease, they are capable, when rightly applied, to remove the patient from adverse conditions, and, by aiding the *vis medicatrix naturæ*, they enable him to tide over attacks of sickness which, untreated, would kill him. For example, while we must confess we know practically nothing of the true nature of *pyrexia*, yet we are well aware that its deadly effects may be successfully combated by the therapeutic use of cold water. In a very large number of cases our treatment of disease must be symptomatic. Whether we understand the true pathology of the disease or not, we cannot fail to recognize that the patient's main distress reveals itself in his symptoms. If we recognize these, and are able to trace them to their true cause, we may by skilful therapeutic assistance remove the symptom and relieve the patient. The immunity thus arrived at at once ameliorates the general condition of the patient, and so hastens his recovery. Let us instance the many diseases in which *asomnia* appears. To ensure a patient sound sleep for a few nights will at once place him in a favourable position for healing processes to take place, and in the end will probably save his life.

Empirical therapeutics are in one way not only admissible, but even necessary, while in another way they represent merely the charlatanism of that quackery which is the natural fruit of crass ignorance. We may fairly apply a drug to cure a patient even if we are wholly in the dark with regard to its *modus operandi*. Thus *quinine* given in ague cures the attack, but we are at a loss to explain the way in which the cure comes about. The danger of empirical therapeutics lies in the proneness there is to group diverse pathological conditions together simply because there is a common result, and then to apply to one and all of these cases a so-called specific remedy. For example: the term "fit" is applied to conditions arising from very various causes; we need hardly point out, it may be produced by reflex intestinal irritation due to ascarides, to undigested food, to epileptiform seizures, alcoholism, hæmorrhage upon or into brain substance, or many other conditions too numerous to mention. Now, a mere empiric might suggest a treatment as applicable to the "fit," but the scientific therapeutist of course inquires into the underlying morbid condition, and attempts to remove the cause of the fit.

But there is a further caution needful in considering this subject. The various diseases the treatment of which is dealt with in the following pages will be found to have very many

drugs placed together as acting beneficially upon them. These wide selections may seem at first sight not only embarrassing, but misleading, were it not remembered that the manifestations of disease show widely diverging peculiarities when grafted upon individuals. While one man may have headache from worry, another suffers on account of a torpid liver, a third is gouty, and so forth. The many drugs are not for any one case, but to indicate rather that the condition is one which has to be looked at from many sides, although attacked only from one standpoint.

In no two cases will a disease reveal itself in quite the same way, and so comes the necessary corollary, that in no two cases can the treatment be pursued upon precisely similar lines. One example may illustrate this. In *pneumonia*, the course so much in vogue in former generations was to bleed freely, and many patients survived this practice. At the present day we avoid bleeding and have resort to stimulants, and yet none will deny that cases do every now and again occur in which depletory rather than stimulant treatment promises the best chance of ultimate recovery. And this example not only illustrates that two cases of the same disease may call for quite different treatment, but further indicates the danger likely to arise if the therapeutist wedded to one system adheres to one line of treatment even in the teeth of symptoms which should contra-indicate it.

The remedies employed do not act in every case directly upon the particular organ at fault. In some cases, however, this direct action does obtain; thus ergot will induce uterine movements without producing effects elsewhere. Ergot, then, together with nux vomica, casca, and other substances, appears to affect involuntary muscular fibres. Bromides and strychnine show an elective influence upon the spinal cord. Turpentine and cantharides, again, affect the renal tissues. On the other hand, we find the larger number of remedies in use appear to produce beneficial results simply by acting upon the whole system.

Medicines soon obtain the credit of being a specific against diseases, but it is dangerous to allow oneself to be influenced by the so-called specific characters of a remedy. Although it is assumed, upon popular theory, that with every bane there is an antidote, yet so complex are the manifestations of disease that no remedy exists which will infallibly cure any given disease. For instance, the salts of iron will unquestionably benefit and even cure anæmia in most cases, still no skilled therapeutist would resort to iron until he had assured himself of the healthy condition of his patient's alimentary tract. And, again, the salicylates are justly termed specifics in the pyrexia of acute rheumatism, and yet in a certain number of cases they utterly fail. It may safely, then, be said that each case of disease must be studied by itself, and a drug or drugs be selected which will not react upon this or that diseased organ, but which will promote the return to the normal of the entire organism.

The Means of Discovering the Medicinal Properties of Various Substances previous to their Administration to the Human Subject.—The methods having this end in view have undergone very many changes within the past few years. The study of physiology and its cognate, pharmacology, have made more rigid and accurate results and deductions possible in the investigation of drugs.

1. *Clinical Research and Observation.*—When substances are accidentally or intentionally introduced into the system, their results can be carefully watched and recorded. By employing the sphygmograph and cardiograph, the effects upon the blood circulation and heart are accurately observed and recorded; the qualitative and quantitative analyses of respired air gauge the effect upon the lungs; the analyses of the urine and other excretions will test the effect upon the emunctories. We need hardly refer to the classical investigations of Sir Robert Christison, made most frequently upon himself, or the more recent and interesting labours of Parkes, Ringer, Frazer, Murrell, and others in this country. On the Continent and in America most valuable investigations also have been carried on.

But there are other methods rendered possible whereby clinical observations are made to elucidate drug action. In treating a large number of patients one is able to classify, and, by giving drugs, of whose general action we are cognizant, to a sufficiently large number, to arrive at very accurate results. In such researches, of course, the instances in which any given effect is produced must be sufficiently numerous to eliminate mere "errors of experiment." In all such investigations we need hardly say that the recovery and welfare of our patients must rank before any other consideration.

2. *Experiments upon Animals.*—Although it cannot be denied that in skilled hands much valuable information may be obtained by experimenting upon animals, yet this method is open to many grave objections, and conclusions based solely upon it are liable to not a few fallacies. In the case of new drugs, perhaps no other course may be open than to ascertain how they react towards animals; but in all cases we must remember that it is dangerous in many instances, as well as inexact, to infer that because a drug produces this or that effect on the lower animals, it will evince the same behaviour as regards the human subject. Allowance has to be made for the habits of the animal, its physiological relations with man, as well as its gross anatomy. When all such variations are taken into account, this method undoubtedly is very valuable. We should, however, remember another caution while upon this subject. Some creatures—pigeons, ruminants, &c.—show peculiar immunities as regards certain poisons, and so care has to be taken when reasoning from beast to man.

3. *Reasoning upon the Affinity of their Botanical Characters.*—Broadly speaking, it may be said that plants which belong to the same natural order will evince a similar action upon the economy. The truth of this has been many times tested, and observers have been frequently led to investigate the behaviour of plants by finding

them associated in an order with other plants which had shown themselves serviceable as medicines. Thus, in the order Solanaceæ we meet with belladonna and stramonium, which reveal common properties. But, upon the other hand, there exist very many exceptions to the proposition stated above—exceptions which render a mere *a priori* line of reasoning dangerous. To illustrate this we may instance the melon, which, as a member of the Cucurbitaceæ, might mislead one to free indulgence in the fruit of ecbalium (elaterium)—a line of induction likely to lead to the most dangerous consequences.

4. *Upon their Affinity in Chemical Composition.*—Here again the exceptions are so common that we cannot accept chemical affinity as being of much value in indicating the probable action of drugs. Of course the chemical relations of bodies may in many cases serve as a hint in their therapeutic uses, but it would be highly improper to attempt any rigid induction from chemical to therapeutic affinity. Some examples may indicate our meaning. Calcium, strontium, and barium possess a strong chemical affinity, and yet, therapeutically, barium appears to partake of the action of digitalis, while calcium and strontium have not, we believe, been employed therapeutically for any heart condition.

It is not suggested that any save the most useful methods have been indicated above; many more means of investigation have been proposed from time to time and have been rewarded with more or less success. With these we have not space to deal; we may, however, mention, in passing, the recent bacteriological methods whereby the bacteria held to be the active agents in producing disease have become subjects of experiment with a view to discovering a means of destroying their virulency.

The micro-organisms may be cultivated in a suitable pabulum —*i.e.*, placed in a vessel containing some material which promotes the growth and development of the bacteria. It is essential that it should do no more than this; it should neither increase nor lessen the bacteria's capacity for infection. Having developed the disease-producing organisms, the pharmacologist sets himself to discover what substances he can successfully employ either to destroy the bacteria or to withdraw from them the power of infecting. These methods, and those of attenuation and vaccination with attenuated virus, come strictly within the range of practical pharmacology, and constitute a division of that science likely to produce great benefits in the future.

With the *Art of Prescribing* we cannot deal at any length. In modern therapeutics the aim is towards simplicity, and so the cumbersome formulæ consisting of *basis, adjuvans, corrigens*, and so on are relegated to the limbo of obsolescence. In all possible cases single drugs are, of course, prescribed, and the all-essential knowledge of the Materia Medica tells us of the solubility, &c., of the material employed. When, as often happens, two drugs, if combined, bring about an action more vigorous than either can effect when given alone, they are ordered in combination; but a

prescription burdened with many drugs suggests a therapeutist doubtful of the accuracy of his selection of a remedy, and savours more of the empirical than the scientific method of healing. Later on we shall deal with the question of methods of giving drugs, of doses, &c. We now have to consider—

The Circumstances which Modify the Action of Medicines.—These may be conveniently considered under the heading of, first, modifying circumstances on the part of the patient.

1. *Idiosyncrasy.*—Without being able to explain why, we observe that certain individuals reveal the most profound reaction towards drugs—a reaction taking the form of immunity from the effects of even toxic doses, or of extreme sensibility to the smallest possible quantities of medicines generally taken without bad effects. Thus some persons will become profusely salivated by a grain of mercury. Christison records cases, in one of which three five-grain doses of blue pill taken on successive nights proved fatal; in another, two grains of calomel produced ulceration, exfoliation of the jaw, and death; in another, three drachms of mercurial ointment caused death in eight days while applied externally. Cinchonism will, in some persons, be provoked by a small dose of quinine, while in others copaiba induces severe renal catarrh. The iodides and bromides upon some persons give rise to eruptions when given in even small quantities. Ipecacuanha, again, when smelt by some persons, will produce the most distressing sense of suffocation. Morphine, so valuable as a sleep-producer, will, in some people, not only fail to induce somnolence, but will give rise to the very opposite condition of wild delirium amounting almost to mania. Idiosyncrasy may be permanent, or may be called into being by states of weakness, and due allowance must be made for this difference.

2. *Sex.*—It is doubtful whether sex, as such, influences the effect produced by drugs. Pregnancy, lactation, and even menstruation, however, do unquestionably act as modifying conditions, and care is needed in giving certain drugs in these conditions. The physique, weight, and height of women will, however, modify the action of medicines, and so it is proper to prescribe smaller and more guarded doses of remedies when treating them.

3. *Age.*—Medicines behave very differently at the various epochs of life. Children and old people bear mercury well; in the case of the first, salivation is rarely, if ever, produced. Children, again, tolerate belladonna remarkably well, and so with many other remedies. On the other hand, opium is singularly obnoxious to children: two and a half drops of laudanum have killed a baby of three days old, three drops a strong child of fourteen months, and four drops a child of a few weeks. (Christison.) In infancy and childhood, blisters and vesicants in general produce most unpleasant consequences, and may even give rise to considerable sloughing and gangrene when kept for some time in contact with the skin. As is indicated below, treating by these remedies must be restricted to adults, and avoided even among these when there is much emaciation and the vitality is low. Again, leeches should be avoided in

children, as they produce far too profound an effect—an effect also apparently out of proportion to the quantity of blood withdrawn.

4. *Temperament and Diathesis* influence the operation of medicinal agents. The sanguine and sanguineo-nervous temperaments bear depletory treatment much better than do the nervous and lymphatic. They are also more easily brought under the influence of stimulants, and hence need smaller doses. Opium, according to the opinion of some practitioners, is better borne by the melancholic than by the sanguine, and furthermore acts more beneficially upon them. Cathartics act very differently on various temperaments; upon the sanguine, small doses of the milder preparations produce ample movement of the bowels, whereas the phlegmatic, who by the way are commonly constipated, require very large and often repeated doses of the strongest drugs before the torpor of their bowels is overcome.

5. *Habits and Mode of Life.*—Exposure to vicissitudes, to roughing it, deadens the sensibility, while habits of luxury, indolence and ease, tend to produce undue nervous sensibility. Persons of the first class reveal a sluggish reaction towards medicines, while those of the second are often profoundly affected by excitants, depressants and other groups of medicaments. The avocations of persons also largely modify the influence of drugs. Town dwellers, factory hands, workers in hot ill-ventilated rooms are as a rule anæmic, and show little resistive power against the attacks of disease. In such persons diseases are apt to run an asthenic course, and all depletory measures produce profound depression, and are hence dangerous. In contrast to such individuals we have the dwellers in rural districts, the open-air workers, and those who, well-fed and housed, lead out-of-door lives, in these classes we find disease pursuing a sthenic course, while medicines to effect any marked influence need to be given in large doses, the most active drugs being called into requisition.

All persons, however, when allowed to take drugs for a long time continuously, grow *habituated.* This habituation brings about a toleration in the individual, so that the drug no longer produces any apparent effect. Thus the habitual indulgence in cathartics leads to increased torpidity of the bowels, necessitating increasing doses, until at length the most vigorous purgatives, even in very large doses, cease to cause action of the bowels. In like manner, opium, morphine, chloral, rapidly grow into habits, increasing doses becoming requisite before sleep is attained. De Quincey's well-known case has unhappily been many times exceeded: a quantity of crude opium swallowed such as would serve to kill many individuals has been taken, with only the result of inducing opium dreams. Habituation to stimulants is again a further example. In the fevers of heavy drinkers enormous quantities of stimulants are needed before the heart is steadied or the pulse affected. Cocaine, itself of recent introduction, has already attracted *habitués,* and these unhappy creatures become as lost to self-respect and self-control as alcoholics or opium-eaters. The knowledge that

this *habituation* occurs enables the practical therapeutist to keep his patient under the influence of a particular drug by the simple expedient of ordering intermissions in its administrations. It should be carefully remembered that upon returning to the use of the drug it is essential that the dose should be not that given at the end of the period of taking the medicine, but rather the initial dose, or some slight advance upon this. Again, when it is desired to give large doses of medicine to a person intolerant of its use, the end can frequently be attained by commencing with small doses, and rapidly increasing the dose until the desired quantity is tolerated by the patient.

Arsenic, among the inhabitants of Styria, is, as is well known, consumed in very considerable quantities, the *habitués* commencing with small doses and rapidly increasing the amount taken daily.

6. *Race* unquestionably exercises a modifying influence. Among the tribes of India, all depressants are very badly borne. Again, the dwellers in northern climes differ considerably from those who reside further south.

Among conditions unconnected with the individual we may notice:

a. Combinations which Modify the Action of Remedies.—It often happens that two or more members of a particular class of medicines will, when combined, act more efficiently than either is capable of if exhibited alone. When it is assured that such a combination can be brought about, the blending is useful, but every care must be taken to avoid linking together medicines which, even if chemically compatible, are nevertheless therapeutically antagonistic. The behaviour of such a compound must be most prejudicial, as the use of really appropriate remedies may be stultified by commingling them with substances which abrogate their activity or lessen it to a minimum.

b. Combination of Medicines Chemically Incompatible.—As a general rule, it is inadvisable to prescribe in the same formula ingredients which are chemically imcompatible, unless the resulting compound be the one which the practitioner wishes to administer; thus, if the citrate of potash is to be given, it may effectually be done, by giving, in one draught, citric acid and the carbonate of potash in solution; these mutually decompose each other; the carbonic acid is evolved, and the citrate of potash is obtained. It does not necessarily follow that, because the ingredients are chemically incompatible, the resulting compound is rendered inert; on the contrary, it may happen that it is much more violent in its operation than either of the ingredients used in its formation. Here we have to call chemistry to our aid, in order thoroughly to understand the changes which take place, and to ascertain what the compound resulting from the mixture is. Having ascertained this point, the next thing is to find out with what medicinal properties it is endowed. Many unchemical combinations are highly useful and valuable—*e.g.*, *yellow wash*, a compound resulting from a

mixture of corrosive sublimate and lime water; *black wash*, that of calomel and lime water; and the *mistura ferri co.*, in which the carbonate of potash and the sulphate of iron are mutually decomposed, a simple carbonate of iron and the sulphate of potash resulting. But of all unchemical combinations, perhaps the most signally used is that of opium and the acetate of lead. These agents react chemically on each other, and produce the acetate of morphine and meconate of lead; yet experience proves the combination to be one of the highest value in hæmorrhage and various diseases.

It must be remembered, also, that it often happens that when so-called chemical incompatibles are combined in a medicine the resulting double decomposition liberates bodies which, from being freshly formed—nascent—possess peculiar activities.

It would be impossible to indicate in this place the very numerous cases in which substances are held to be incompatible. Chemical incompatibility is not in all cases an insuperable objection to their being blended as indicated above, but there are many mineral preparations which it would either be dangerous or useless to combine—*e.g.*, calomel with alkaline chlorides, lest corrosive sublimate is formed, acids with alkalies, strychnine salts with spirits of chloroform, and so on. There are other forms of incompatibility—namely, what we may call pharmaceutical; in such the mischief arising is, that unsightly although useful mixtures are formed—*e.g.*, those containing iron and a vegetable preparation in which tannin exists; and mixtures incompatible with the secretions of the body, such as large doses of alkalies given during a meal; of these we shall treat under the heading of *the best time when to administer medicine.*

c. The Regulation of the Dose.—Almost every drug operates differently when given in a small and in a large dose. Tartar emetic, for example, in doses of from $\frac{1}{12}$ to $\frac{1}{6}$ of a grain, acts as a diaphoretic and expectorant; in doses of from $\frac{1}{4}$ to $\frac{1}{2}$ of a grain, as a nauseant; and if carried to the extent of two or three grains, it proves powerfully emetic. A very similar series of effects is produced by graduated doses of ipecacuanha; indeed, various observations tend to show that this drug in very small doses acts as a powerful anti-emetic. The neutral salts are aperient in large doses, and diuretic in small ones; opium acts as a stimulant in small, and as a narcotic in large, doses; and the oil of turpentine, in doses of one to two drachms, is an acrid irritant to the kidneys and genito-urinary organs, whilst in doses of an ounce, especially if combined with castor oil, it operates freely on the bowels, without producing any renal or vesical irritation. These are but a few examples out of many which might be quoted; but it may be observed, generally, that most of the medicinal substances whose operation is mild and beneficial in small doses, may be converted into powerful poisons by being administered in large quantities.

The familiar names for doses such as drop, teaspoonful, and so on, are of course wholly unscientific and are likely to mislead unless

used with much caution. In the case of drop, we find that while forty-five *drops* of water go to a drachm, one hundred and thirty-two of the tincture of the perchloride of iron are needed, and as many as one hundred and fifty of sulphuric ether to fill the drachm measure.

Although useful, posological tables cannot be accepted as infallible guides about doses. Each individual has his own dose, and the skilled therapeutist must, to be successful, acquire the art of apportioning doses to individuals. The habits, the sex, weight, height, activities of the emunctories, as well as the patient's previous behaviour towards drugs, will assist in arriving at a conclusion. It would obviously be reprehensible to give a delicate woman five grains of compound elaterium powder, while it would be as short-sighted to apply one leech to deplete a navvy of six feet in stature. The environing conditions also must be carefully examined before a dose is selected, nor must the precise action which we expect the drug to perform be lost sight of. We have already pointed out that persons soon grow habituated to drugs, and hence it becomes necessary to increase the dose if we desire to produce any appreciable effect. But many diseases seem to produce tolerance in individuals for certain drugs. It is well known what quantities of narcotics will be needed to allay the distress of cancer. The pain accompanying cancer of the uterus defies opium unless that substance be given in the most heroic doses, and even requires that these should be rapidly if not daily increased. But on the other hand many individuals exhibit marked susceptibility to certain drugs, so that in their case the smallest dose may act in the most baneful fashion. It becomes our duty then to test our patient before pushing any of the more powerful remedies.

Very many methods of computing the dose by the age of the individual have been proposed, but none quite fulfils the requirements of the case. One of the best is due to Dr. R. O. Cowling.* The rule is that the dose is represented by the quotient of the age of the patient at his next birthday divided by 24. This applies up to the age of puberty. Thus a child of seven years would have the proportionate dose of 8 divided by 24; $\frac{8}{24}=\frac{1}{3}$. In infants this rule cannot be safely followed, at all events in the case of narcotics, since, as we have shown above, they are very intolerant to this class of remedies. Indeed, so susceptible are young children to nearly all medicines that the most cautious dosing should be practised.

Again, the dose of medicines employed varies with the method in which they are exhibited, when we deal with *modes of administration of medicines* we shall have to point out that substances injected into veins act with dangerous effect, and when injected into the subcutaneous tissue the effect is far more rapid and violent than when the medicine is swallowed. These circumstances must therefore be borne in mind in regulating the dose.

d. The Character, Period and Form of the Disease.—As pointed out above under the heading of idiosyncrasy, every individual

* Wood's Therapeutics, p. 22.

exhibits certain peculiarities which go some way towards modifying the disease in his particular case, and so it becomes the duty of the therapeutist not so much to treat the *disease*, but rather to combat it as exhibited by each individual patient. If this course be pursued it will soon be discovered that no two cases submit themselves to quite the same routine of treatment, or evince improvement under precisely identical lines of management. In like manner it will be found that epidemics differ very widely in their general features, and so call for diverse treatment. In some outbreaks of typhoid fever cerebral complications appear early; in some uncontrollable diarrhœa, while others are distinguished by the presence of confirmed constipation. And when we study the natural history of epidemics we are struck by the fact that they individually vary in their behaviour to treatment, thus a remedy which at one stage of an epidemic was found highly satisfactory, will fail utterly at another period of even the same epidemic.

Diseases also in the different stages through which they pass require quite diverse and judiciously varied treatment. The inflammatory stage has to be combated by remedies such as would be of little or no service later on, and so throughout the progress of the disease. In this connection we may again insist upon the extreme importance of a careful and searching clinical study of symptoms, since it is often by their aid that we arrive at a diagnosis of the precise phase into which the disease has passed, and so we are enabled to apply the appropriate remedy at the right time.

e. Certain morbid conditions of the body, or the intensity of the disease, must, of necessity, greatly modify the action of the remedy. Illustrations of this are constantly met with in practice. It is well known, for instance, that in severe spasmodic affections, large and repeated doses of opium are borne without a single ill consequence; doses which, if administered under ordinary circumstances, or in milder cases, would almost prove fatal. Perhaps the disease which exhibits the greatest tolerance of medicines is tetanus. In a case quoted by Dr. Bennett, a patient, labouring under this disease, took, in the course of ten days, no less than 4 pounds, 7 ounces, and 6 drachms of laudanum, besides 6 ounces, 4 drachms, and 45 grains of solid opium. In another case treated by Dr. Eben. Watson, the patient took, in forty-three days, no less than 1026 grains of the alcoholic extract of Calabar bean, and recovered. Stimulants have also been given to an almost incredible extent, without producing any ill consequences, or even a marked effect on the system; thus Dr. Currie mentions a case of tetanus, in which the patient took 140 bottles of madeira in less than a month; the daily quantity being four or five bottles of wine, besides brandy, ale, 2 gallons of strong broth, and $2\frac{1}{2}$ drachms of laudanum. The patient recovered. Purgatives appear to make even less impression. In another case, the patient took, in forty-eight hours, 210 grains of scammony, 89 grains of gamboge, 1 ounce and 4 scruples of jalap, $2\frac{1}{2}$ pints of infusion of senna, and 8 grains

of calomel! Decided benefit is stated to have followed this treatment.

f. A deranged condition of any of the principal functions of the body modifies and interferes with the operation of medicines. This is peculiarly observable in the digestive organs; when these are the seat of functional derangement or organic lesion, medicines whose operation on the animal economy is mild and beneficial otherwise, may thus be rendered either prejudicially irritant or perfectly inert. Under these circumstances, quinine ceases to act as an antiperiodic, digitalis as a diuretic, and tonics, instead of imparting tone and vigour, are converted into distressing irritants. Practitioners often complain of the intolerance some anæmic patients exhibit towards iron, and assert that the remedy appears to do more harm than good. And this is so. Iron cannot be absorbed by an unhealthy mucous membrane, so it is harmful to dose patients with it until we have cleared out the bowels and restored the alimentary tract to healthy function. When this has been accomplished the iron preparation will prove easily tolerated and most valuable.

g. The influence of diet on the action of medicines is very considerable. The medical man who contents himself with merely ordering certain medicines, and who does not at the same time regulate the patient's diet, neglects to avail himself of a most valuable auxiliary, and may be allowing the presence of an antagonist, which, in all probability, will counteract all the benefit that might otherwise be reasonably expected to result from his prescriptions. Who, for instance, can expect benefit from depletatory medicines so long as a full animal diet with wine and stimulants is simultaneously pursued? and can we be surprised at the failure of a course of tonics if only weak slops and a depressing diet be followed? The diet should in every case be regulated so as to promote, as far as possible, the operation of the medicines which are being employed at the time. This is a point which cannot be too strongly insisted upon.

The importance of dietetics is now happily more fully recognised by the profession than it was in former times; and their further study, in practice as well as in theory, as accessories to the exhibition of drugs, will, it is confidently believed, lead to better results in the treatment of disease. Many instances are on record in which well-directed medical treatment has been frustrated by the patient indulging in articles of food or drink, without the sanction, and sometimes in direct opposition to the directions, of the medical attendant; hence, we should not be content with simply giving directions on the subject of diet, but, whenever practicable, we should see the instructions followed out in the letter as well as in the spirit.

h. The Period of the Day when Medicine should be Given.—The action of medicines is very considerably modified by the time at which they are administered, and no practical physician can afford to neglect giving close attention to this point. Remedies whose

presence is likely to produce irritation in the alimentary tract—*e.g.*, arsenic, iron, zinc, and some others—should be administered after food, so that they may be worked up into a harmless mass with the digested foods. Another reason why substances of this class should be given immediately after food is, that many of them are not easily absorbed, and stand a better chance of entering the system during the period of greatest local activity and vascular turgescence. Medicines which rank as nutrients—*e.g.*, cod-liver oil, malt extracts, peptonized or pancreatized materials—should be given with the meal. The weakly mucous membrane of anæmic or marasmic persons is capable of but slight digestive activity and only at long intervals. Hence, unless the cod-liver oil or other preparation be given immediately after the food as a part of the meal, it will not be assimilated, but will lie in the stomach to nauseate until it is expelled by vomiting. Generally it may be affirmed, that therapeutic agents should be given during or at the close of a meal when we desire to effect their early and easy absorption, or if we are anxious to avoid their local action upon the gastric mucous membrane. Again, the reaction of the stomach contents varies from extreme acidity immediately the process of digestion has commenced, to almost neutrality when, stomach digestion completed, the peptonized food is passing through the pylorus to undergo intestinal digestion. It is at this time, as pointed out by Sir William Roberts, of Manchester, that alkalies may be administered with pancreatized foods with every expectation of their passing unchanged into the duodenum. Pepsine or alkalies in small doses should precede the meal, as their presence serves to promote the healthy secretion of the mucous membrane. When there is a scanty secretion it may be assisted by giving acids with pepsine, but they should not precede a meal, since the acid is liable to check the normal secretion. Alkalies, when given to influence the blood, should be administered upon an empty stomach, as if given with a meal they will in large doses hinder chylification and upset digestion. Remedies whose required action is local upon the mucous membrane of the stomach, should be given before meals. Thus arsenic, usually ordered to follow a meal, will, in cases of gastralgia, give relief only when exhibited before food. Various preparations possess the power of precipitating the peptones of food or of destroying the activity of pepsin, such are, corrosive sublimate, tannic acid, &c., and these should therefore be ordered to be taken between rather than just before a meal. The nature of the food taken also influences the time for giving medicines. All starchy foods are acted upon by the preparations of iodine, and so the efficacy of the later are affected injuriously. Cathartics are, as a rule, best given upon an empty stomach, and hence the tradition and custom of "pills at night, draught in morning." Saline cathartics should always be taken in the morning fasting, and followed in an hour by draughts of hot tea. When taken in this way, Friedrichshall and other saline waters are the most valuable of remedies. If

administered after breakfast Friedrichshall water is said to increase urinary secretion more than the intestinal. Alcohol, when administered medicinally, should be given in small doses before meals, if it is desired to assist an enfeebled digestion, as copious draughts of fermented liquors taken during meals act upon the pepsin and delay, or even completely stay, peptonization. When alcohol is ordered with a view of checking fever waste, and supporting the heart, the doses should be small and often repeated, as in this way absorption becomes possible. Narcotics operate most favourably if given an hour or two before the time at which the patient usually retires to rest, sufficient time being allowed for the stage of excitement to pass over. Emetics are best given towards night, so that the sleep which usually supervenes on their use may be the more readily indulged. Diaphoretics are, likewise, administered with the greatest advantage at the same period, the circumstances of warm bed-clothes, a horizontal position, and an equable temperature, favouring their operation. On the other hand, diuretics are best given during the day, when the surface of the body can be kept moderately cool.

i. Light, air, and exercise influence the action of medicines more than is generally allowed. When we group these requisites for physiological health with others under the head of personal hygiene there will be few who will contest the statement that no one can be benefited by medicines unless the wholesomeness of his habits and surroundings can be assured. Exercise without doubt retards the action of narcotics even when taken in toxic doses. The importance of keeping persons moving while dangerously under the influence of opium, &c., is recognised and acted upon in opium poisoning. An illustrative case is recorded in Lockhart's Life of Scott. A young farmer swallowed a quantity of laudanum in mistake for some other medicine. Whilst all around him were stupid with fear he rose, saddled his horse and rode to the doctor's house some six miles off, nor did he feel the effect of the drug until he alighted, when it instantly began to operate. He recovered. There is no doubt that narcotics are best administered when the patient is least prone to restlessness, and that they require larger doses to act when there is excitement and much muscular movement.

k. Season has been held by some to influence the results produced by medicines, but there seems but slender evidence upon which to found such an opinion. For the present we must confess that it is a matter which we have no means of proving one way or another.

THE MODE IN WHICH A MEDICINE IS GIVEN.

Various plans have been employed for administering medicines.

α. It is swallowed, and when its rapid action is called for, the fluid form is chosen.

β. The medicine is given by the rectum, as an injection, enema,

or suppository, and this mode of administration is especially adopted for those cases where a local as well as a general effect is aimed at. Rectal alimentation in incontrollable vomiting, in gastric ulcer, is one of the most valuable of therapeutic methods.

γ. The medicine may be injected by an hypodermic syringe into the subcutaneous tissues. For the use of the alkaloids, and soluble remedies which can be used in small quantities, this method is of the utmost value. The solutions employed must be non-irritating, and must not be used in any bulk, lest troublesome subcutaneous abscesses and even sloughing be started at the seat of injection. As a rule the prick of the needle is not objected to, but if the patient is nervous the parts may be numbed by cocaine. Merely picking up the tissues, if they are pressed between the finger and thumb, can be made to deaden sensation. The needle should be inserted quickly and withdrawn slowly, the injection if large being stroked abroad from the point of injection. Absorption of medicines injected hypodermically is very rapid, so that patients can in this way be brought speedily under the influence of a remedy. Much valuable information upon the subject of hypodermic medication will be found in Professor Eulenburg's valuable treatise in Von Ziemssen's Handbook of Therapeutics. Cases of poisoning are especially suitable for treatment by this method, as an emetic action, if apomorphine be employed, can be ensured in a few minutes, or the physiological antidote rapidly be introduced into the system. Valuable results have also been said to have followed the hypodermic treatment of syphilis, especially in those cases where it was desirable to get the patient rapidly under the influence of mercury.

δ. Medicines have been used by inunction. The axillæ, the groins and inner surface of the thighs, and the abdominal parietes are all situations which are available for rubbing in the active principles of medicines made up into mixtures with vaseline, glycerine or some fatty material. The method of stripping a surface of its epithelium by blistering and applying the remedy to the denuded area, has but little recognition at the present time. Treatment by inunction is certainly valuable, either alone or especially when employed in conjunction with rubbing.

ε. There are many affections of the respiratory tract which are best treated by local topical medication and it is these which receive so much relief from inhalations. The *vapores* of the British Pharmacopœia might with considerable advantage be increased in number. But besides merely inhaling vapours from an atomizing machine, or breathing the impregnated steam from a bronchitis kettle, there are other and more complex plans now in use, designed especially for the relief of phthisical patients. Rooms are so constructed that it is possible to maintain them at any given temperature and moisture, and at the same time effect a complete impregnation with some remedial agent. Much benefit appears to follow this rational method. Medicated respirators are also useful. The patient inhales through

the material in the respirator, and so draws some of it into his chest in a particulate form. Atomizing apparatuses for laryngeal medication enable the expert to apply to the unhealthy laryngeal mucous membrane the substance he deems most suitable.

ζ. Treatment by medicated baths takes a position between those already considered, for while the whole surface of the skin is brought into contact with the impregnated fluid of the bath, the lungs inhale the vapour and so mucous and dermal surfaces are alike brought under treatment. The use of medicated baths, however, must be ordered with caution, as the exertion and depression often involved in going through a course of baths may severely tax the resources of an invalid. For cutaneous affections there can be no doubt of the great value of this branch of therapeutics.

The purity of the medicine employed should engage the earnest attention of the practitioner; otherwise his best efforts may prove not only unavailing but perhaps injurious. This it is which forms the strongest bond of union between Materia Medica and Therapeutics, and the reason why they are so generally studied together. Every one who aims at being a successful therapeutist should make himself master of those peculiar characteristics by which he may know, with some degree of certainty, whether the agents he employs in his researches are of such a quality as to justify any conclusions he may draw with regard to their operation. The importance of securing the purity of the drugs employed has been painfully evidenced on several occasions. When impure samples were employed large doses were taken with impunity, but upon resort being had to a fresh and pure supply, the same doses produced disastrous results. Several cases of poisoning have arisen in this way, especially with aconite and the other more powerful vegetable remedies. The matter has recently been brought before the profession owing to the unpleasant effects following the employment of nitrite of sodium. It was found that one of the first advocates of this remedy had worked with samples of the nitrite adulterated with the nitrate, a very feeble salt. It was natural that patients should bear large doses of the mixed salt, and should become most injuriously affected by the pure nitrite. It is a good plan, when ordering any drug not commonly used, to ascertain whether it has been kept a length of time, and is of a nature to have undergone any change either in the way of becoming more potent by concentration or more feeble by depreciation.

Disguising the taste of nauseous medicines is often a matter for consideration, particularly in the case of children and delicate women. Castor oil, one of the most useful aperients in the Materia Medica, is often rendered inadmissible on account of its taste; and it is, consequently, important to discover some means by which it may be disguised without impairing its medicinal activity. This remark applies even more strongly to cod-liver oil. Strong coffee, hot milk, or lemon syrup, will answer in a degree; or the medicine may be made into an emulsion with yolk of egg, sweetened with

syrup, and coloured with tinct. cardam. co.; but all these plans are inferior to the simple one of chewing a piece of lemon or orange peel, or a few cloves, or any aromatic substance, immediately previous to swallowing the medicine. The taste of senna may be concealed by sweetening the infusion, adding milk, and drinking as ordinary tea, which, when thus prepared, it much resembles. The taste of quinine is concealed by tannin; aloes, and chloride of ammonia, by liquorice; and the sulphate of magnesia, by the compound infusion of roses. Syrups are generally agreeable to children, and may be used for disguising unpleasant medicines. In order to obviate the taste, some drugs may be given in the form of effervescing draughts, the carbonic acid which is set free tending not a little to enable the stomach to retain the medicine. Nauseous liquid remedies, as copaiba, are sometimes advantageously given in the pill form, or in gelatine capsules, or enveloped in wafer-paper.

With the view of economizing space, and preventing useless repetitions in the body of the work, the following list of some of the principal authorities quoted from is appended, and it is to be understood that whenever a page or volume is inserted after an author's name, it is to one of the subjoined works or papers reference is intended, unless otherwise specially mentioned. In other cases, references are inserted in a footnote.

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MANUAL

OF

PRACTICAL THERAPEUTICS.

PART I.

1. Abri Semina. Jequirity. [Brazil.] Prayer-beads. The produce of Abrus Precatorius [Indian or Country Liquorice Plant], common throughout the Tropics. Scarlet seeds with black spot at apex: are of the size of a small pea. They are very hard, and scarcely admit of being pulverized.

Med. Prop. and Action. The seeds, when swallowed, are quite innocuous; but possess great toxic powers when forced into sores or under the skin. Jequirity has been introduced into ophthalmic surgery. Its action was formerly held to be due to the presence of a bacillus,[1] but the weight of evidence goes to show that the action exercised by jequirity is really due to a ferment it possesses. Prof. C. J. H. Warden[2] describes the properties and action of Abrus. He finds two active principles, a proteid, and one resembling amygdalin. A temperature of 100° C. prevents the action of Abrus probably by coagulating the proteid principle. The infusion is made as follows:[3]—Powdered seeds, 3 parts; cold water, 500, with hot water 500 added. Cool; and when cold, filter.

2. *Therapeutic Uses. In Ophthalmic Surgery,* jequirity is used in the form of a powder and an infusion. In *granular lids,* its use initiates an ophthalmia, which leads to a cure of the original complaint. The lids may be painted with the infusion (*v. supra*) three times a day, and the application repeated if needful.

3. *In Hæmorrhoids,* jequirity has also been used.

4. *In Skin Diseases,* jequirity, by virtue of its power of setting up a healthy inflammation which tends to heal, offers a valuable means whereby obstinate, unhealthy ulcers may be induced to take on a healthy action. *In Lupus and Cutaneous Ulcers* in general, jequirity is said by Dr. Shoemaker,[4] of Philadelphia, to be a most useful application. The seeds should be decorticated by bruising in a

[1] Dr. Klein, Centralbl. f. d. Med. Wissenschaft, viii. 1884.
[2] Indian Med. Gaz. Dec. 1882.
[3] Extra Pharm. p. 1.
[4] Lancet, Aug. 1884.

mortar; the red shells, separated from the cotyledons, and covered with distilled water to four times their weight; subsequently, after maceration, they are reduced to a smooth paste and painted on the ulcer. Dr. Shoemaker has in some few cases found an erysipelatous inflammation follow the use of jequirity, which, however, subsided under ordinary treatment.

5. Acaciæ Gummi. Gum Acacia. Gum Arabic. A gummy exudation from the stems of Acacia vera, and other undetermined species of Acacia. *Source,* Arabia and Africa, from Senegal to Egypt.

Med. Prop. and Action. Demulcent and emollient. It has been thought to be nutritive, and has been suggested as an article of diet for diabetic patients, but the evidence of its utility on both points is inconclusive. In bringing up children by hand the addition of gum arabic to milk, a teaspoonful to each bottle, has been recommended, as it prevents the precipitation of the casein in lumps, and keeps it suspended in fine flakes. This is an indication of great practical value (Binz, p. 3). It is an excellent adjunct to other remedies of the same class, in pulmonary and genito-urinary affections.

6. *Therapeutic Uses. Coughs and Hoarseness* dependent upon dryness and irritation of the throat are often relieved by allowing a piece of gum to dissolve slowly in the mouth. The mucilage forms an excellent vehicle for cough mixtures.

7. *In Gastro-intestinal Irritation, Diarrhœa, in Ardor Urinæ and Calculous Affections,* the free use of the mucilage, combined with other demulcents or sedatives, often proves of service.

8. *In Infantile Diarrhœa,* gum acacia is very favourably spoken of by Dr. R. W. Foss.[1] In the simple forms he found the mucilage, 1 part to 3 of water, generally sufficient; but when the stools are green and accompanied with vomiting, or when there is almost constant involuntary diarrhœa, the addition of a little grey powder has a rapidly beneficial effect.

9. *To Sore Nipples,* Sir E. Wilson speaks of the mucilage of acacia as a useful application. He directs it to be pencilled on the tender part immediately after suckling, and the nipple to be protected with a leaden shield. He also speaks favourably of the application of a powder composed of equal parts of gum acacia and borax.

10. Acetal or Dimethylacetal. *Source,* oxidation of Alcohol.

Med. Prop. and Uses. Acetals are volatile bodies; they possess an æthereal odour. By heating alcohol and aldehyde with sulphuric acid and pumice-stone, acetals are formed. Solubility in water, 1 in 8. It has a bitter, burning taste, and resembles peppermint. Von Mering[2] describes the physiological effects as follows:—

In frogs, motor paralysis and torpor, with general anæsthesia, ensues upon endermic application. In warm-blooded animals small doses produce drowsiness, large ones torpor and anæsthesia, which pass off. The pulse rate remains unaffected. Fuller doses cause loss of consciousness and reflexes with mydriasis (which atropin annuls), with final cessation of respiration. The blood pressure sinks, falling *pari passu* with the dose.

[1] Brit. Med. Journ. Sept. 3, 1870. [2] Berlin Klin. Woch. Oct. 1833.

The order in which the centres succumb are, according to Von Mering, the cerebral, the spinal, and lastly, those of the medulla. When given to human subjects, sleep resulted, but no vomiting, headache, or malaise. Other observers do not substantiate these last facts. Professor Leyden found his patients vomited and suffered much from headache and malaise.

11. *Therapeutic Uses.* As a hypnotic, Stoltenhoff gave it with success in persistent *Insomnia following Dementia.* In some cases a state resembling intoxication occurs, in which no pain is felt. Dr. Hiller[1] pronounces it six time weaker than chloral. He relinquished its use, as it produced stupefaction and weight in the head on the morning following its administration. He found enormous doses (ʒij.–iij.) are needed to induce sleep, and states that its taste is so burning as to be prohibitive against its use.

12. Acetum. Vinegar.

Med. Prop. and Action. Vinegar in its undiluted state is a stimulant and astringent, and when taken internally in large or continued doses, even when diluted, it acts injuriously on the stomach and its functions, inducing gastric pain and irritability, colic, anorexia, and eventual emaciation and cachexia. Taken, however, in moderate quantities, as an adjunct to food, its action seems salutary in many instances. As a medicinal agent it is of considerable value. It reduces the temperature and the frequency of the pulse. Taken largely diluted with water and moderately sweetened, it displays decided soothing and refrigerant properties, and is employed with advantage *in febrile and inflammatory affections*, quenching the thirst, calming the vascular excitement, re-establishing the functions of the skin, and restoring the action of the kidneys. The refrigerant influence of diluted vinegar applied externally is undoubted: it not only diminishes heat, but allays pain. *In Hæmorrhagic affections*, the cold feeling which it produces on the skin is extended to the whole system; hence the benefit derived from it in internal hæmorrhages, and inflammation of the cavities; as, for instance, in *uterine hæmorrhage*, when applied to the thighs and abdomen; and in *acute meningitis*, applied as a lotion, to the shaved scalp. *In general fever*, sponging the body with vinegar and water is applicable to every case in which the skin is preternaturally hot, when no idiosyncrasy stands in the way. The vapour of hot vinegar acts as a stimulant, and as such proves useful in many throat affections. Sprinkled about a sick-room it acts in a degree as a deodorant, and is generally extremely refreshing to the patient. In combination with ammonia (Liq. Ammoniæ Acetatis) it acts on the skin; combined with soda and potash, on the kidneys. In *Narcotic Poisoning* it has been recommended to be administered after the stomach has been evacuated by an emetic. The fact, however, of its forming a soluable salt with morphia would negative its use in *poisoning by opium.* It is a direct antidote *in poisoning by the alkalies.* In these cases it is a safe and efficient remedy.

13. *Therapeutic Uses. In Exanthemata and other Febrile Affections* sponging the body with vinegar diluted with water (1 part of vinegar to 6 or 8 of water) is a most soothing and refreshing application. A somewhat similar mixture, sweetened to the taste, forms a refrigerant drink in the same class of cases.

14. *In Scarlatina*, dilute acetic acid internally was lauded by Mr. Isaac B. Brown. Experience has not confirmed his high estimate of it, although doubtless it is useful as a refrigerant, especially when applied externally as directed above. Aromatic

[1] Deutsch. Med. Wochensch. Feb. 1883.

Vinegar (*infra*) has superior claims, except in point of expense. *Scarlatinal Sore Throat* is often much benefited by the inhalation of the steam of hot vinegar.

15. *In most varieties of Laryngeal Inflammation, Hoarseness, Relaxed Sore Throat, and Ulceration of the Fauces,* especially if aphthous in its character, decided benefit is often derived from the inhalation of the vapour of hot vinegar (Christison).

16. *In Phthisis* the value of the external application of diluted vinegar to the chest and upper part of the body, in allaying the *profuse perspirations,* is well known; it is a measure attended with salutary effects, and is of great comfort to the patient. Sir C. Scudamore's mixture for this purpose is composed of 1 part of vinegar, 1 of eau de Cologne, and 2 of water.

17. To persons subject to attacks of *Catarrh, Asthma, and Angina Pectoris,* the practice, during the intervals, of bathing the chest every morning with vinegar and water, as advised above, seems often to diminish the liability and to act as a preventive. *In Hæmoptysis,* used both externally and internally, its use is indicated, but it is a remedy of minor importance.

18. *In Uterine Hæmorrhage,* intra-uterine injections of diluted vinegar (1 to 2 of water) were favourably noticed by Dr. D. Davis,[1] in 1836. More recently they have been employed in six or eight cases of post-partum hæmorrhage, "with very good effect and encouraging results," by Dr. Snow Beck.[2] He does not regard it as the most suitable agent that can be employed, but free from the dangers which attended the use of Liq. Ferri Perchloridum (*q.v.*) Cloths steeped in cold vinegar and water applied to the pubes are not only agreeable to the patient, but serve in a degree to arrest the hæmorrhage. Ergot may be simultaneously employed, if necessary. *Epistaxis* is sometimes effectually arrested by introducing into the nostril a piece of lint saturated with vinegar.

19. *In Scurvy,* vinegar has occasionally proved useful, but it is greatly inferior to lemon or lime juice, or to fresh vegetables.

20. *In Purpura,* whether attended by fever or of a passive character, Sir Erasmus Wilson (p. 348) advises sponging the body with tepid vinegar and water.

21. *To Bruises, Sprains, Contusions, and limited Inflammations,* diluted vinegar, a popular application, forms a useful refrigerant lotion. It should be kept continuously applied. A little alcohol may be advantageously added to it.

22. *To Milk or Mammary Abscesses,* warm vinegar is stated by Dr. Dewees to be so successful in the early stage of the disease that we need not, in general, look for any other remedy. "It is," he states, "particularly useful when the breasts are greatly and painfully distended with milk; and it should be perseveringly employed for twenty-four hours." His testimony in its favour is very strong. Should it fail, belladonna, leeches, poultices, &c., must be had recourse to.

[1] Obst. Med. p. 1065. [2] Obst. Journ. Feb. 1874.

23. *Particles of Lime in the Eye* are effectually dissolved, and the pain eased, by bathing the eye with diluted vinegar.

24. ACIDUM ACETICUM GLACIALE. ACIDUM ACETICUM. ACIDUM ACETICUM DILUTUM.

Med. Prop. and Action. Glacial acetic acid is only employed as an external agent; it is a very powerful caustic. Applied to the skin, it produces intense redness and pain, followed by rapid vesication. It must be used with caution, as its action extends to a considerable depth, and a severe sore is produced. It may be used as a vesicant where the absorption of cantharidine would be prejudicial, as in some affections of the kidneys. Glacial acetic acid dissolves cantharidine freely, and the solution so prepared may be used for rapid blistering. Acetic acid may be applied externally as a rubefacient, vesicant, escharotic, and antiseptic. Administered internally to man or animals, the concentrated forms of acetic acid act as powerful corrosive and irritant poisons. Dilute acetic acid may be used internally, in the same manner as vinegar, as a refrigerant and astringent.

Aromatic Glacial Acetic Acid, vulgo "*Aromatic Vinegar*," consisting, besides the acid, of the oils of rosemary, neroli, cinnamon, bergamot, lavender, and rectified spirit, is lauded by Dr. J. J. Dougall[1] as a disinfectant and deodorant, though in the former character he never uses it to the exclusion of sulphurous fumes. It is directed to be dropped on a hot shovel, and volatilized through the house daily; or, where its price is a consideration, a little may be poured occasionally into a small vessel of hot water, and placed over the gas in the patient's room: thus it becomes dissipated, diffusing a pleasant odour in the apartment. At the same time, he uses the diluted acid (℥j. ad Aq. ℥j.) for sponging the body, by which two objects are attained, lowering the temperature, and disinfecting the skin. It is alike agreeable and refreshing to the patient. In all *Scarlatinal cases*, especially during desquamation, he directs it to be used twice daily. He regards it as vastly superior to the practice of inunction; indeed, he condemns the latter as prejudicial, blocking up the mouths of the glands, through which the poison should find egress from the blood. On the other hand, he says, by sponging the skin with the aromatic acid, the infectious scurf is permanently deprived of its dangerous properties, while the orifices of the gland-ducts are cleared of their morbid secretions, and a free exit established to the poison from the blood. Moreover, by the oxidation of the contained essential oils, ozone, a powerful disinfectant, is generated, and by sponging the surface as here directed, an atmosphere of ozone may actually be made to evolve gradually and constantly from the patient's skin, floating under the bedclothes, and enveloping every part of the body. Prof. Jaccoud[2] testifies to the value of cold lotions of dilute aromatic vinegar as a means of reducing the temperature in *Typhoid Fever*.

Dose:—Of Acetic Acid, ♏iij.–♏xv. *Of Dilute Acetic Acid*, fl. drm. j.–ij.

25. *Therapeutic Uses. In Herpes Circinatus (Scurfy Ringworm)* the affected patches should be washed with dilute acetic acid (B. Ph.), or with a little soft soap, and drying afterwards with a rough towel. Common black ink is a popular remedy, and the acetic acid it contains makes it a very efficient one. It acts by dissolving off the semi-adherent scurf, as well as the superficial layers of the cuticle, and so detaching with the cells the parasitic growth that thrives on them. *In Tinea Favosa, Favus (Honeycomb Ringworm)*, the remaining hair having been cut short, the removal of the crusts may be facilitated by poulticing, or better still, by the application of lint soaked in dilute acetic acid, and covered with oiled silk to retard

[1] Brit. Med. Journ. Nov. 15, 1879. [2] Med. Times, Feb. 17, 1883.

evaporation. The acid permeates the epidermic tissue in which the favus matter is imbedded, and by softening and swelling up the epithelial cells, makes the whole mass soft and easy of removal. When this is complete, the scalp is ready for the process of epilation. (Dr. B. Squire, "Syst." v. pp. 977, 981).

26. In *Ringworm*, when the patches are recent and small, blistering them by the application of glacial acetic acid sometimes proves effectual. *In obstinate cases of Psoriasis and Lepra* much benefit has been derived from the use of baths acidulated with acetic acid. *In Chloasma*, lotions of dilute acetic acid are of service in softening, detaching, and removing the diseased epidermis. (Dr. Squire, *op. cit.* p. 991.)

27. *Cancer.* Hypodermic injections of the dilute acid were tried by Dr. Broadbent, but without any success. Dr. J. Barclay recommends the use of the dilute acid in cancerous ulceration.

28. *Indolent Enlargements of the Cervical Glands* have been treated by Dr. Morell Mackenzie[1] by the hypodermic injection of dilute acetic acid (B. Ph.) in the manner advised above by Dr. Broadbent. Of 27 cases, 15 were cured by resolution and 4 benefited; in 5 suppuration followed, and in 3 it failed. He injected gutt. v. to xx. according to the size of the gland; the average dose being gutt. vij. to viij., repeated not oftener than once a week. The fluid should be injected well into the middle of the gland: suppuration followed when it was injected too superficially or too frequently. The average duration of cure by resolution was three months. If suppuration takes place, the fluid should be drawn off with a hypodermic syringe, or aspirator.

29. *Nævus Maternus.* Dr. Behrend, of Berlin, advises, in the case of small flat nævi, the application of strong acetic acid, followed by compresses soaked in vinegar. Under this treatment, the nævus becomes hard and yellow, and is thrown off by a process of exfoliation.

30. *Corns and Warts* may be effectually removed by the application of the strong acid. The wart should be first carefully pared down, the acid should then be applied with a camel's-hair brush, and subsequently compresses, soaked in vinegar, should be kept in contact with the part.

31. *To Syphilitic Warts and Vegetations*, which resist milder remedies, glacial acetic acid may be resorted to: it is less painful than nitric acid (*q.v.*), and causes the tissue to liquefy, and as it were to melt away. (Hill and Cooper, p. 590.)

32. Aconitia. Aconitine. A white amorphous alkaloid, obtained from the root of Aconitum napellus, and probably other species of Aconite.

Med. Prop. and Action. Powerful sedative poison, unsuited, on account of its highly poisonous properties, for internal administration. It is, however, used hypodermically, a solution of Aconitin, gr. j. in ʒss. of water, and Ac. Sulph. D. *q.s.*, being employed in doses of ♏j. to iv. In man and animals its action seems directed to the nervous system, and through it to the heart. Sensation is lost; there is staggering gait and inability to walk; the heart's action

[1] Med. Times May 29, 1875.

becomes gradually slower, and death takes place by asthenia. Externally it may be applied in the form of ointment or solution. The Unguentum Aconitiæ of the B. Ph. contains Aconitia grs. viij., Rect. Sp. fl. drm. ½., Prepared Lard, oz. j. Dr. Fleming's ointment consists of Aconitia grs. xvj., Rect. Sp. ℥xvj., Lard ℥j. An alcoholic solution, consisting of grs. viij. to fl. oz. ij. of Rect. Sp., has also been used as an external application. When rubbed on the skin, in the form of ointment or solution, it produces a sensation of heat and pricking, succeeded by a feeling of numbness and constriction of the part, as if a heavy weight were laid upon it, or as if the skin were drawn together by the powerful and involuntary contraction of the muscles beneath. This sensation lasts from ten to twelve hours, according to the quantity rubbed in. It produces very slight, if any, vascular excitement, not more than may very easily be accounted for by the friction itself. (Turnbull.[1]) Dr. Fleming states, that when his aconite ointment is applied to the conjunctiva, it produces *contraction* of the pupil; but that, when applied to the temples and forehead, it produced, in two instances, dilatation of the pupil, attended with partial blindness. In consequence of its high price, it has been frequently adulterated, and found almost inert. Care should be taken not to apply the ointment or solution of aconitia where the skin is abraded.

33. Poisoning by aconite and aconitia has become matter of history. It is therefore important in this connection to review the various sources from which the alkaloid and preparations may be derived, since they vary in power according to the variety from which they are obtained. M. Oulmont[2] finds aconite from one province—the Vosges—much less active than that derived from Dauphiny. He adds, that of one preparation of nitrate of aconitine, $\frac{1}{250}$ gr. proved fatal. The importance of this statement at once becomes apparent when we add that writers recommend $\frac{1}{140}$ gr. doses, and even more.

34. Prof. Plugge[3] describes three varieties of aconitine—(1) English, (2) French, and (3) German; the English being 17 times as powerful as the German. Prof. Binz remarks that there is no definite chemical compound appertaining to the name "Aconitia"—samples of the various makers presenting quite diverse physiological effects. According to Flückiger and Hanbury,[4] aconitia is really a mixture of aconitine, pseud-aconitine and picraconitine. Dr. Murrell points out that Aconitum ferox and the Japanese members of the family are, it is probable, in common use, although unspecified in English pharmacy. He collects numerous cases[5] of fatal results following the substitution of one variety of aconitia for another. Summing up, we may say it is imperative that in prescribing aconitia its source should be specified, and due allowance made for the variety in use.

Physiological Action. Dr. Hunter Mackenzie has carefully worked out the action of these bodies. He finds aconite and aconitia act primarily upon the respiratory functions through the centre and peripheral branches of the vagus.

They possess no direct action upon the heart or vaso-motor system.

Upon the nervous system they do not influence the cerebrum or sensory

[1] On the Med. Prop. of the Ranunculaceæ, p. 126.
[2] Rev. de Thérap.
[3] Internat. Med. Congress, 1881, p. 474: "Sur l'activité léthale des différentes espèces d'Aconitine."
[4] Pharmacographia.
[5] Brit. Med. Jour. April 1882

tracts of the cord; they do, however, enhance the excitability of the motor nerves and columns. They excite, but subsequently paralyse, the peripheral sensory nerves.

So far from producing muscular paralysis, they increase muscular excitability.

They determine convulsions by heightening the excitability of the motor channels.

They increase temperature at first, later they depress it.

They kill by asphyxia and respiratory collapse.[1]

35. *Therapeutic Uses.* Externally, Aconitine in ointment relieves the pain of *Sciatica, Neuralgia,* and *Muscular Rheumatism.*

Internally, hypodermic doses of $\frac{1}{200}$ gr. to $\frac{1}{120}$ gr. are most useful in neuralgia of the fifth pair.

36. *Asthma, Angina Pectoris, Paroxysmal Cough, Palpitation.* Prof. Gubler extols aconitia in these complaints, and also lauds its action upon other painful affections of the circulatory and respiratory tracts. He recommends $\frac{1}{32}$ gr.

37. *Rheumatoid Arthritis* is, according to Dr. Oulmont, well treated by this alkaloid. He further recommends its use in *Otitis, pain of Dental Caries,* and *Paraplegia.*

38. Aconiti Radix et Folia. Aconite Leaves and Root.

Med. Prop. and Action. The symptoms induced in man by small therapeutic doses are reduction of the force and frequency of the circulation, a sense of muscular inertia and weakness, and a slight tingling in the extremities or in the lips. If the dose be large, all these symptoms are intensified, the muscular weakness is extreme; the tingling is felt over the whole body; the pulse is feeble and reduced to 30 or 40 per minute; the respirations are diminished; giddiness and disordered vision may be manifested, especially when the erect posture is assumed. After three or four hours those symptoms gradually subside. When a poisonous dose has been ingested the first thing noticed in most cases is a burning or tingling in the throat or in the extremities, soon spreading over the whole body. The pulse rapidly falls in frequency, and in a very little time becomes exceedingly weak, intermittent, irregular, and finally imperceptible; the muscular strength is greatly reduced and sometimes almost entirely gone; the respirations are shallow, feeble, irregular, and infrequent; the general sensibility is very much benumbed, so that marked anæsthesia of the surface is present. The skin is bedewed with a cold sweat; the countenance is anxious, sunken, livid; and the eyes are often protruded, or are even spoken of as glaring; the pupil is generally dilated, but when there are no convulsions may be contracted; gastric burning is sometimes complained of, and severe vomiting may be present, but the stomach is not rarely retentive. The intellect generally remains unaffected until very near the close, sometimes to the very moment of death; Percina, however, cites cases in which stupor was present. In the collapse in the latter stages of aconite poisoning, the special senses may be lost, especially the sight. The voice is very generally extinguished. Convulsions occur in some cases, not in others, and the patient in the majority of cases is unconscious during their continuance. Death may occur suddenly, especially directly after some exertion on the part of the patient, from syncope. (Dr. H. C. Wood, p. 176.) The action of aconite in reducing the temperature is noticed more particularly in the section treating of its use in Inflammatory and Febrile Affections (*infra*).

Treatment of Poisoning by Aconite consists in the administration of powerful stimulants—*e.g.*, brandy, ammonia—after using stomach-pump and emetics. Cold affusion has been found serviceable.

[1] Pract. 1878 and 1879.

Contra-Indications. 1. Great depression or constitutional feebleness of the vital powers. 2. Headache and other affections, arising from anæmia or chlorosis ; or whenever there is a torpid or paralytic condition of the muscular system. 3. All cases in which there is obvious mechanical impediment to the passage of the blood, particularly through the heart and lungs. 4. Irritability of the circulation, with great diminution of power, such as occurs after serious hæmorrhage.

Dose:—Of the Tincture (Aconite Root in coarse powder oz. iiss. Rect. Spirit Oj.) ♏v.–xv. This is the dose laid down in B. Ph., but in order to obtain the full effect of the remedy, doses of one-third of these quantities suffice ; hence, at the commencement at any rate, much smaller doses (♏j.–ij.–iij.) every four hours had better be employed. (See next section.) This tincture is the best form for internal use. *Of the Extract of the fresh Leaves and Flowering Tops*, gr. j.-ij. (B. Ph.), a very uncertain preparation ; if used, had better be commenced in smaller doses and gradually increased. For external use only, *Aconite Liniment* (Aconite Root oz. xx., Camphor oz. j., Rect. Spirit q.s. ad Oj.)

Dr. Fuller (p. 426) recommends that the tincture be given in conjunction with a few drops of dilute sulphuric acid—its solubility is ensured and its full power is exerted, since, if given with alkalies, aconitia is precipitated and rendered inert.

39. *Therapeutic Uses. Acute Inflammatory and Febrile Affections.* In these cases, when characterized by increased action of the heart and circulatory system and abnormally high temperature, aconite possesses considerable power as an antipyretic. (1) It should be given at the outset, or during the first stage of the affection, and (2) when no complications co-exist. The doses employed by different writers exhibit a wide range ; Dr. Wilkes prescribing ♏iij.–v. every four hours, and Dr. James ♏ij.–iij. every three hours ; whilst Dr. Reith places the dose between a quarter of a drop and one drop. Dr. Ringer directs half a drop to one drop of the tincture to be given in a teaspoonful of water every ten or fifteen minutes for two hours, and afterwards to be continued every hour. If there be much prostration, and the pulse be feeble and weak, the dose should, he advises, be still smaller. The occurrence of the sensation of "pins and needles" is a sure indication that the remedy has been carried to its full extent, and that it should be discontinued. It seems to have proved especially valuable in *Febrile Catarrh*, a single dose at the outset often diminishing or removing the symptoms.

40. Dr. Murchison[1] regards aconite as a remedy of great value for reducing the pulse and temperature in *Fever*, and especially in the pyrexia resulting from inflammation, and that it is much less used than it deserves to be. Dr. R. H. Bakewell[2] states that for five-and-twenty years he has been in the habit of giving aconite in the form of Fleming's tincture, ♏iij.–v. every four hours, and that he rarely has found it fail to lessen the frequency of the pulse and lower the temperature in the early stages, not only in *Enteric Fever*, *but in all Febrile Diseases* and *Acute Inflammations*. Dr. Milner Fothergill explains the effect of aconite in reducing febrile temperature by its changing the dry to a moist perspiring skin, and so increasing the loss of body heat by increasing variation and

[1] Brit. Med. Journ. Feb. 17, 1872.

[2] Lancet, April 10, 1880.

evaporation. This explanation, however, is deemed insufficient by Dr. Ringer (p. 454), who states that aconite not infrequently reduces the temperature quickly without promoting sweating. Dr. Bomford [1] bears witness to the value of aconite in the *Remittent Fevers of India*. He gave it in small, one-minim doses every hour or so, and found it succeed after quinine had failed. He claims for it, in these cases, the following good effects:—1. It reduces the temperature. 2. Renders the pulse slower, fuller, and stronger. 3. Cleans the tongue and restores the digestive functions. 4. Induces sleep. 5. Increases the quantity of urine; and (6) promotes perspiration. It is also grateful to the palate.

41. *Pneumonia.* Dr. W. Dobie [2] details four cases of pneumonia in which aconite, in small, frequently repeated doses, apparently cut short the attack. In one he gave ℥ij. of the tincture (B. Ph.) every half-hour for the first two hours, and afterwards ℥j. every four hours; in another he gave ℥j. every half-hour for the first four doses, and then ℥½ every four hours. Similar doses were given in the other cases. They all came under treatment within 24 hours from the beginning of the disease, and it is chiefly then that aconite proves of such signal service. "Not," adds Dr. Dobie, "that it is altogether useless after the first day; on the contrary, whenever the pulse and the temperature run very high and there is no marked prostration, aconite, in carefully regulated doses, will often be found useful in moderating vascular excitement, relieving pain, and inducing sleep." It is not to be supposed that it will always prove successful.

42. *In Puerperal Fever*, Dr. Playfair (vol. ii. p. 328) regards aconite in minute doses as a most valuable remedy. He gives a single drop of the tincture at first every half-hour, increasing the interval according to the effect produced. Generally after four or five doses at half-hour intervals the pulse begins to fall, and afterwards a few doses at intervals of one or two hours will suffice to prevent the heart's action rising to its former rapidity. Its effects require most careful supervision, for if continued too long, or given at too frequent intervals, it may unduly depress the circulation, and do more harm than good. If the pulse becomes very weak, or if it intermit, the remedy should be stopped at once. It is most likely to be useful in the early stage of the disease, before much exhaustion is present, and then only when the pulse is of a certain force and volume. It should not be given in those cases in which rapid prostration is manifested by a feeble, thread-like, irregular pulse, profuse sweats, and cold extremities.

43. *In Tonsillitis, Acute Sore Throat, and in Acute Catarrh of Children*, Dr. Ringer strongly recommends the tincture (gutt. ½–gutt. j. every 10 or 15 minutes for two hours, and afterwards hourly). A high temperature, he considers, affords both an indication for its administration and an assurance of success. Dr. Morell Mackenzie (p. 57) states that the tincture in doses of ℥ij.-v.

[1] Practitioner March 1881. [2] Ibid. June 1879.

every three hours is sometimes very efficacious in tonsillitis, but that in his hands it has not proved so successful as guaiacum (*q.v.*). Its use is limited almost entirely to the first stage of the attack.

44. *In Acute Rheumatism*, aconite at one time was held in high esteem. Since the development of the salicine treatment, however, it has fallen in abeyance. *In Chronic Rheumatism*, Dr. Fuller believes aconite to be very useful, both externally and internally. In rheumatic pains occurring in gouty subjects, Professor Graves has found it very serviceable. The same remark applies to *Lumbago*. It is noteworthy that the drug acts quickly or not at all. In all these cases Liniment of Aconite (B. Ph.) is a valuable local application, and its use should be conjoined with the internal administration of this remedy. *Rheumatic Headaches* are sometimes benefited by small doses, either alone or conjoined with other appropriate remedies.

45. *In Neuralgia*, aconite is a remedy of great value, but its use appears to be restricted mainly to those cases in which all signs of active disease are absent or have been subdued by other means. In chronic cases its operation is often speedy and permanent, but even in these it fails so long as the secretions are out of order and the general health much impaired. These conditions being rectified by the due use of purgatives, &c., aconite will often evidence its action when previously it had failed. In all cases it is advisable to commence with its use externally; should this fail, it may subsequently be given internally. *In Sciatica*, Dr. Fuller concludes that it proves a valuable and efficient remedy in many obstinate forms of the disease. *Tic Douloureux* often yields to its local application, attention being paid at the same time to the state of the bowels and general health. *Toothache* is sometimes speedily cured by rubbing the gums with a few drops of the tincture, or introducing it on a bit of cotton into a carious tooth. With reference to its use in this class of cases, Dr. Ringer justly observes:—"If aconite succeeds at all, it will succeed at once; hence, if no relief is speedily obtained, it is useless to continue its employment." According to Dr. H. M. Jones,[1] the efficacy of aconite in neuralgia is greatly increased by combining it with quinia, which seems to add permanency to the relief afforded by the former, and is especially indicated in neuralgia occurring in anæmic or debilitated patients without any apparent nerve lesion or exciting cause.

46. *In Tetanus*, the use of aconite in large and repeated doses was first proposed by Mr. De Morgan,[2] who relates several cases illustrative of its efficacy. Other cases successfully treated by it are related by Dr. G. Smith,[3] Dr. Sedgwick,[4] Dr. Woakes,[5] and Prof. Winderlich.[6] It acts by diminishing the irritability of that portion of the nervous centre which controls reflex muscular action, and the success which has attended its use warrants further trials with

[1] Med. Press, July 1, 1868.
[2] Brit. For. Med. Chir. Rev. April 1859.
[3] Mad. Quar. Med. Jour. Jan. 1861.
[4] Brit. Med. Jour. Jan. 20, 1860.
[5] Ibid. Oct. 26, 1861.
[6] Med. Press, June 2, 1869.

it. There appears to be a great tolerance of the drug in this disease.

47. *In Diseases of the Heart*, in which the chief indication is to diminish vascular excitement or irritability of that organ, aconite proves in the highest degree serviceable. *Nervous Palpitations* often yield to small doses. Even in *Pericarditis*, when the heart throbs violently, and thus produces extreme pain, aconite, according to Dr. Ringer, will quiet the heart and speedily ease the pain. From its powerfully depressing action on this organ, it is evident that it should be used with the greatest caution, or be held as contra-indicated in organic diseases, where the power or force of the heart is impaired. It is more a remedy for functional derangement than for organic disease.

48. *In Erysipelas*, aconite was a favourite remedy of Liston, if resorted to in the early stage of the attack, when the febrile symptoms run high. *To Painful Sprains* and *Bruises* and *Chronic Arthritic Swellings*, Lin. Aconiti, locally applied, often affords speedy relief. The topical application of a mixture of T. Aconiti and T. Opii succeeded in the hands of Sir E. Wilson (p. 146) in three instances in relieving *the severe intercostal pain accompanying Herpes Zoster*; in others it failed.

49. *In Amenorrhœa*, Dr. Copland prescribed the extract with decided benefit; and Dr. Ringer (p. 460) states that *in sudden Suspension of the Menses*, as from cold, it may be employed with advantage; he likewise states that the acute stages of *Gonorrhœa* may be well treated with gutt. j. of the tincture every hour, and that the same treatment will often remove *Chordee*. For the relief of severe *Uterine Pains*, Lin. Aconiti externally applied occasionally affords relief when other remedies fail; or lint soaked in a mixture of equal parts of the tincture and of water may be placed over the seat of pain and covered with oil-silk (Dr. Tilt).

50. Adeps Præparatus. Prepared Lard. Axungia. The purified fat of the hog.

Med. Prop. and Action. Emollient; not administered internally, except occasionally as an ingredient in laxative enemas. It enters into many ointments and cerates. From the rapidity with which it becomes rancid, it is inferior to Benzoated Lard (Adeps Benzoatus, B. Ph.); prepared by melting together by the heat of a water-bath, Benzoin gr. 160 and Lard lb. j.

51. *Therapeutic Uses.* In *Scarlatina*, inunction of the surface with lard, or of a mixture of equal parts of lard and suet, first proposed by Dr. Schneemann in 1849, was warmly advocated by Mr. Taylor[1] and others, and found many followers both in England and the Continent. Its use was soon extended to other *Inflammatory Fevers, Measles* and other *Exanthemata*. Beneficial as the practice undoubtedly was in many cases, it has now in a great measure been superseded by carbolized oil and other local disinfectants. Dr. Dougall[2] speaks disparagingly of inunction. *See* Aromatic Acetic Acid.

[1] New Treatment of Febrile and other Diseases. 8vo. London. 1850.
[2] Brit. Med. Jour. Nov. 15, 1879.

52. ÆGLE MARMELOS, *D.C.* Bael. Bela. Bengal Quince. *Nat. Ord.* Aurantiaceæ. *Hab.* East Indies and Ceylon.

Med. Prop. and Action. Although all parts of this tree are employed medicinally by the natives of India, the fruit alone calls for notice in this place, and it merits particular attention from the valuable property it apparently possesses of establishing a healthy tone in the intestinal canal, arresting diarrhœa when present, and acting as a mild aperient when constipation exists. According to the analysis of Mr. Pollock[1] and Prof. Macnamara,[2] it contains tannin, a bitter principle, a vegetable acid, a peculiar balsamic principle, and gummy and fibrous matter. The tannin and balsamic principle exist in the largest proportion in the ripe fruit. The astringent action of bael is doubtless due in a measure to the tannin; but Dr. Macnamara suggests that to the balsam is due the tone which the fruit gives to the intestines, rendering the secretions of the mucous membranes more healthy. It may be advantageously given in the form of sherbet, thus—Take of the soft gummy substance from the interior of the fruit oz. ij., mix this with fl. oz. iij.–fl. oz. iv. of water, sweeten to the taste, and add, if procurable, a lump of ice. This agreeable drink possesses the aroma of the fruit, and may be repeated twice or thrice daily. When prepared from the ripe fruit, it is not only astringent, but possesses the singular property of being aperient if the bowels are irregular or costive. When the patient is debilitated and the stomach weak, it sometimes disagrees; it ought then to be given in small repeated doses, and if these also are rejected, the dry extract (Ind. Ph.) in doses of gr. xxx.–gr. lx. twice or thrice daily, may be tried. Another good form of administration is that of *marmalade* prepared in the same manner as orange marmalade; it is usually taken like it, spread on bread, and it possesses the great advantage of keeping well for a long period.

The Dose of the Liquid Extract (*off.*) is fl. drm. j.–ij., but it may be carried to a larger extent with impunity.

53. *Therapeutic Uses.* In some forms of *Intestinal Derangement*, bael exercises a marked and valuable influence. Though noticed by Rheede, Burman, and other old writers, it attracted little notice till 1853, when Sir Ranald Martin[3] called attention to its use. In 1854, Dr. A. Grant[4] states that he has been in the habit of recommending the sherbet (*ante*) as an aperient to persons subject to *Habitual Constipation*, a small tumblerful taken early in the morning producing generally one evacuation daily. *In cases of Dyspepsia with obscure symptoms of Land Scurvy*, it seemed also to act very beneficially, and to possess alterative as well as anti-scorbutic qualities. Many persons in Bengal, observes Dr. Grant, suffer, especially during the rainy season, from attacks of *Irregularity of the Bowels, periods of looseness alternating with others of constipation;* in such states of the system the sherbet acts admirably, in the first instance as an astringent, and in the second as an aperient. It serves in both these opposite conditions to stimulate the mucous membrane to a more natural action, combining with the ingesta and aiding healthy assimilation. It is in *Scorbutic Dysentery* that its powers are best marked; indeed, Dr. Maclean (i. p. 123) expresses his conviction that where there is no scorbutic taint, it is without efficacy, and he considers that it has fallen into disrepute as an anti-dysenteric simply from its indiscriminate use. Sir Joseph Fayrer, who in a *brochure* (London, 1878) has

[1] Lancet, July 1853.
[2] Indian Ann. of Med. Sci. ii. p. 233.
[3] Lancet, 1853, vol. ii. p. 53.
[4] Ind. Ann. of Med. Sci. ii. p. 225.

brought together all that is known on the subject of bael, attributes its occasional failure in *Dysentery* to its employment in the early stages of the disease: he properly limits its use to the purely chronic stage, adding truly, "It is useless in the acute forms." *In Chronic Diarrha*, it has also been strongly recommended. Dr. Goodeve (i. p. 101), however, speaks of it in very qualified terms; he states that he has sometimes seen benefit from its use, but has been frequently disappointed in its effects. He adds that bael disagrees when the digestion is feeble, producing flatulence, acidity, and loss of appetite; in such cases he recommends its being taken at bedtime instead of the morning, as is usual. Some interesting remarks on the use of this remedy have been published by Dr. Cleghorn.[1]

ÆTHER. See ETHER.

ÆTHYL, BROMIDE OF. See HYDROBROMIC ETHER.

ÆTHYL, IODIDE OF. See ETHYL, IODIDE OF.

54. AGARICUS ALBUS. White Agaric, or Purging Agaric.

Med. Prop. and Action. It occurs in white, irregular pieces; it possesses a faint odour; sweetish taste. Its composition is at present hardly understood. The following bodies have, however, been described:—Agaricin, agaric acid, fungic acid, boletic acid. An extract (dose gr. iij. to v.) and a tincture (mxx. to lx.) are mentioned in Martindale's Extra Pharmacopeia. It possesses different actions according to the dose employed, producing purging in full, and checking secretions, diarrhœa, bronchial flux, sweating, and the secretion of milk, when given in small doses.

55. *Therapeutic Uses. Diarrhœa.* Agaric in small doses is said to check diarrhœa; its power in this way must not, however, be too readily accepted, as accounts of its use are very contradictory.

56. *Sweating of Phthisis, &c.* As far back as the middle of the last century,[2] agaric was used for this troublesome symptom. The use in this connection was made of agaric by Barbut[3] and others. Bisson,[4] writing in 1832, advises doses of from four to ten grains at bedtime, and when diarrhœa supervenes he adds opium to his prescription. Bisson finds also that it induces sleep and prevents exhaustion. Trousseau and Andral[5] used it for night sweating.

Dr. Wolfenden[6] uses twenty- or thirty-grain doses in the evening. He recommends that Dover's powder be given in conjunction, as this prevents the diarrhœa. Dr. Murrell, however, points out that "if we give the Dover's powder, we do not want the agaric."

57. Dr. Young[7] uses agaricine, a crystallized principle, and finds it useful in checking sweating, easing cough, and inducing sleep.

Agaricin, to check sweating, is given in doses of $\frac{1}{13}$ grain in pill.

Dr. Murrell[8] reviews the action of the drug very carefully, and

1 Ind. Ann. of Med. Sci. ii. p. 223.
2 Dahen Ratio Medendi.
3 Journ. de Méd. t. xlvii.
4 De l'Agaric Blanc. E. Bisson, M.D. Paris. 1832.
5 Peter. Bulletin Gen. de Therapeut. No. 6. 1879.
6 Med. T. and G. Oct. 1881.
7 Glasg. Med. Journ. March 1882.
8 Practitioner, vol. xxix. p. 324.

gives, as his experience of it, that in the night sweating of phthisis it proves very useful, although it is difficult of administration, as, if given in large doses, the taste cannot be disguised, and more often than not it will set up very severe purging. Dr. Murrell has employed a tincture (1 in 6).

58. *Constipation.* Upon the authority of Stillé and Maisch, it is stated to have been used in olden days as a purgative.

59. *Hæmoptysis.* Dr. Murrell has given agaric with success in some cases of hæmoptysis.

60. *Bronchorrhœa, &c.* Agaric has some power of checking excessive secretion, and hence has been recommended in supersecretion of bronchi, mammary glands, &c.

61. Alcohol, Absolute Alcohol. Spiritus rectificatus, Rectified Spirit. Spiritus tenuior, Proof Spirit. Spiritus Vini Gallici, Brandy. Mistura Vini Gallici, Brandy and Cinnamon Water, āā ʒiv. with yolk of two eggs.

Med. Prop. and Action. The action of the various substances containing alcohol varies according to the amount present, the presence of other bodies, such as sugar, empyreumatic ethers, &c.

The physiological effects of alcohol are thus ably summarized by Dr. Lauder Brunton:[1]—(1) Alcohol in small quantities increases the secretion of the gastric juice and the movements of the stomach, and thus aids digestion. Although unnecessary in health, it is useful in exhaustion and debility. (2) It increases the force and frequency of the pulse by acting reflexly through the nerves of the stomach. (3) In large doses it impairs digestion by over-irritating the stomach. (4) It may produce death reflexly by shock. (5) After absorption into the blood, it lessens the oxidizing power of the red blood corpuscles, and thereby is rendered useful in reducing temperature. When constantly or very frequently present in the blood, it causes accumulation of fat and fatty degeneration of organs. (6) It undergoes combustion in the body, maintains or increases the body weight, and prolongs life on an insufficient diet; hence it is entitled to be reckoned as a food. (7) If large doses are taken, part of it is excreted unchanged. (8) It dilates the blood-vessels, increases the force and frequency of the heart's beat by its action on the nervous centres, to which it is conveyed by the blood, imparts a feeling of comfort, and facilitates bodily and mental labour. It does not give additional strength, but merely enables a man to draw upon his reserve energy. It may thus give assistance in a single effort, but not in prolonged exertions. (9) The same is the case with the heart, but in disease alcohol frequently slows instead of quickening the pulsations of this organ, and thus economizes instead of expends its reserve energy. (10) By dilating the vessels of the skin, alcohol warms the surface at the expense of the internal organs. (11) The symptoms of intoxication are due to paralysis of the nervous system; the cerebrum and cerebellum being first affected, then the cord, and lastly the medulla oblongata. It is through paralysis of the medulla that alcohol usually causes death. (12) The apparent immunity which drunken men enjoy from the usual effects of serious accidents is due to paralysis of the nervous mechanism, through which shock would be produced in a sober condition.

62. The subject of alcoholism has recently been worked at by Dr. Jos. M. Dujardin-Beaumetz, who found in pigs that when the digestion was slow and continuous, the results were vomiting of biliary matter and glairy mucus, and severe diarrhœa.

[1] Practitioner, Feb. 1876.

Dyspnœa, muscular tremor, and paresis of hinder extremities were marked. The post-mortem appearances were those of congestion of the alimentary tract and liver. Cirrhosis was absent, while atheroma of the arteries, especially of the aorta, existed. Extravasations of blood into tissues were abundant. It was found that the more impure the spirit employed, the more marked were the pathological changes.

These results tally with those usually evidenced at autopsies of chronic alcoholics.

Dr. Newell Martin (N. Y. Med. Journ. 1883) summarized the direct action of ethylic alcohol upon the heart. In non-tonic doses no quickening of pulse occurred; blood, containing $\frac{1}{4}$ % when introduced into the heart, lessened materially the amount of work done; the higher the percentage of alcohol the less was the work done. The action of the alcohol was *only* when it reached the muscle and nerve tissue. The systole was very imperfectly performed. It was found that alcoholized blood parted less readily with its oxygen than the normal blood, and hence the tissues suffered. When alcohol was introduced into the stomach, these effects did not follow as only a small proportion was absorbed, while rapid elimination took place.

63. *Therapeutic Uses. To superficial Inflammations, Bruises, Sprains, &c., attended with heat and pain, but without abrasion,* diluted spirit (1 to 6 or 8 of water) applied on a thin piece of lint, forms an excellent evaporating lotion. *In Gout,* Sir C. Scudamore speaks favourably of a tepid lotion of 1 part of alcohol and 3 of camphor mixture. *In Cerebral Affections,* ice is generally preferable to diluted spirit, but in its absence the latter may be used advantageously. In all these cases it is of the greatest importance to renew the lotion repeatedly, so as to keep the part constantly moist.

64. *In Ptyalism,* Sir T. Watson states that he has found nothing more generally useful than a gargle composed of 1 part of brandy and 4 or 6 of water.

65. *To Bed-sores,* in the early stage, an excellent application is a mixture of equal parts of rectified spirit and white of egg, applied frequently with a feather, and renewed as it dries till an albuminous coating is formed over the part (Christison). *To prevent the occurrence of Bed-sores,* it is a good plan to bathe the parts subjected to pressure daily with undiluted brandy; it serves to harden the parts.

66. *To prevent Sore or Fissured Nipples,* a daily application, for some days before delivery, of brandy or of a mixture of brandy and olive-oil, is said to be effectual: it acts by hardening the tissues. Stillé (i. p. 651) states that it is rendered more effectual by the addition of a small proportion of alum or tannin.

67. *Internal uses. Stimulants.* The question of the administration of stimulants is one presenting great difficulty. That alcohol should be administered in carefully graduated doses, as carefully as in the case of the most powerful drugs, most practitioners are

agreed; but as to the quantity needed, and the best means of giving alcohol, there still exists much difference of opinion. We do not propose to debate the advisability of giving alcohol in slight ailments or its habitual consumption in health.

68. *Acute Diseases.* Alcohol is useful in cases in which the patient, overwhelmed by the stress of the disease, needs sustaining until, the strain being past, he falls back upon his physiological reserve. In such cases alcohol has been found to lessen tissue change. The pulse serves as a guide: with very frequent and very small pulse, alcohol is needed. Dr. Waters has emphasized this, and adds that an intermitting pulse is also a call for alcohol. Hence in *Pneumonia*, *Typhus*, *Typhoid*, and *Acute Exanthemata*, when they take on a malignant form, stimulants are required.

69. *In Pneumonia occurring in aged people*, stimulants, he considers, may be given with benefit.

70. *In Rheumatic Pericarditis*, stimulants are often very beneficial; wine answers very well in some cases, but where there is much depression, brandy should be given.

71. *Fever.* The subjoined abridged remarks of Dr. Murchison (p. 269), although having special reference to *Typhus and Typhoid Fevers*, offer some valuable suggestions for the use of stimulants in the advanced stages of fevers of all descriptions.

There are cases of typhus and typhoid fevers which, under a supporting diet and mineral acids, do not require wine or brandy at any stage of their course.

They are rarely required during the first five or six days, but most cases require them more or less during the second week; as a rule, they may be commenced about the seventh or eighth day.

The chief indications for their use are derived from the organs of circulation.

Extreme softness and compressibility of pulse, especially if irregular, intermittent, or imperceptible, are greater indications for stimulants than mere rapidity; an abnormally slow pulse (*e.g.*, 40 to 60) is occasionally a stronger indication for stimulants than a quick pulse. If the pulse becomes quicker and the face flushes under their use, they are contra-indicated; if the pulse is made slower, they may be expected to do good.

The state of the heart affords valuable information: if the cardiac impulse is good, stimulants are not required; but when the impulse is weak, and when the first sound is impaired or absent, a liberal allowance is demanded; in all cases of doubt the heart should be examined with the hand and stethoscope.

Other indications for the use of stimulants are—(*a*), a tendency to syncope, when the patient is raised into the semi-erect posture; (*b*), the eruption becoming darker and more copious; (*c*), profuse perspirations, with no attendant improvement in general symptoms; (*d*), coldness of the extremities; (*e*), the marked presence of the typhoid state—*i.e.*, low delirium, tremor, subsultus, &c.; (*f*), a dry, brown tongue: if the tongue becomes clean and moist at the edges,

it is a sign that the alcohol is doing good; (*g*) the presence of complications, as pyæmia, erysipelas, bronchitis, pneumonia, bed-sores, or gangrene; (*h*) persons of intemperate habits, or of advanced years: here they are required earlier and in larger quantities.

Scanty urine of low specific gravity, containing little urea or much albumen, and complete suppression of urine, are in themselves indications against a large amount of spirits.

As a rule, they are contra-indicated if there be severe darting or throbbing headache, or acute noisy delirium, especially when these symptoms co-exist with great heat and dryness of skin and suffusion of the eyes, and with little or no improvement of the cardiac and radial pulse. When stimulants are thought to be required under such circumstances, they should be given in the intervals between the paroxysms of delirium.

The propriety of giving stimulants in delirium depends upon the state of the pulse: if the patient becomes more restless and delirious under their use, they do harm; if he becomes more tranquil, they do good.

Port, sherry, madeira, brandy, gin, and whisky are the forms in which alcohol is best given; but when a weaker stimulus is wanted, claret and burgundy answer well; malt liquors are best adapted for convalescence. Spirits should be given diluted—iced soda-water is the best vehicle; but when great prostration exists, hot brandy or whisky punch is the best stimulant; they should be given in divided doses, frequently repeated. In urgent cases, a dose may be given every hour, and as a rule a larger quantity will be required during the night and towards morning than in the daytime, for it is usually in the early morning that the vital powers are at the lowest ebb; many patients are undoubtedly lost from negligence of their attendants at this time. It is impossible beforehand to decide upon the quantity required; begin with 4 oz. of wine in twenty-four hours, and watch its effects. It will be rarely necessary to give more than 8 oz. of brandy daily at any period of the fever; occasionally this may be exceeded; it is astonishing how much some persons, of previously temperate lives, can take with advantage. In urgent cases they should be persisted in as long as the patient is able to swallow; apparently hopeless cases have been known to recover under frequent enemas of beef-tea and brandy; when the symptoms improve, the quantity should be reduced, and smaller doses ordered at longer intervals; in most cases of great prostration it is as well to combine other stimulants —*e.g.*, ether—with the wine and spirits.

The following words of Sir W. Jenner's deserve ever to be borne in mind. "For the last thirty years," he remarks, "I have made it the rule of my practice in the treatment of *typhoid fever* to abstain from giving alcohol if in the case before me I *doubted* the wisdom of giving it; when in doubt I do not give alcohol in typhoid fever, and when there is a question in my mind of a larger or smaller dose, I, as a rule prescribe the smaller: the reverse of the rule I laid down for myself in the treatment of *typhus fever*.

72. The more recent researches of Testi Alberico ("Il Raccoglitore," Nos. 10, 11) quoted in "Pract." vol. xx. 222) show the following action of alcohol in fever :—

1. No lowering of temperature follows its use.
2. Alcohol, during its stay in the system, acts as a valuable vaso-motor dynamic.
3. Indirectly, it takes on the *rôle* of an aliment, while it increases tissue metamorphosis.

73. In the treatment of the *Exanthemata*, the lighter French wines, which contain less alcohol than madeira, port, or sherry, as bordeaux, mixed with water, make a most agreeable and refreshing beverage : it supports strength and induces sleep. In the treatment of *Scarlatina*, claret was first proposed by Dr. A. T. Thomson, and has of late years been extensively prescribed; it is an excellent adjunct to carbonate of ammonia, quinine, and the mineral acids.

74. *Diphtheria.* There are few cases of diphtheria, observes Dr. Morell Mackenzie (p. 159), in which systematic feeding does not constitute the most important part of the medical treatment. The administration of alcohol in small quantities, he continues, is almost always advisable. In some cases, it is true, it may not be called for during the whole of the attack, but very often it supplies us with the best chance of saving the patient's life, and it must then be pushed with a boldness rarely needed in other forms of disease. Small doses of alcohol will usually be found sufficient in the earlier stages of the attack : two ounces of brandy or four ounces of wine in the 24 hours may be prescribed for an adult, and proportionate quantities for a child. In other cases, however, larger doses are required from the commencement. But whatever may be the earlier symptoms, we must always be prepared to increase the dose rapidly, if the appropriate indications—attacks of syncope, irregular (very frequent or very slow) pulse, and delirium, present themselves. In these circumstances a high temperature does not in itself contra-indicate the employment of stimulants. In all cases it is necessary to keep a careful watch upon the pulse, which will give invaluable information as to the need of alcohol. Rapid and fatal failure of the heart often supervenes quite suddenly and unexpectedly, and the first indication of such failure is the signal for the unsparing use of the drug. Patients suffering from the prostration and exhaustion of diphtheria bear large amounts of stimulants without any of the usual intoxicating effects, and as much as 20 ounces of brandy have been given to an adult within 24 hours with manifest benefit. Champagne may occasionally be substituted for brandy, but this wine, in the active stage of the disease, often causes pain in deglutition, and as a rule is more useful during convalescence. Whenever there are signs of approaching cardiac failure, it is important to keep the patient in bed, with his head low, and to interdict any movement whatever. A neglect of this precaution has often been attended with fatal results. (Mackenzie.)

75. *In Delirium Tremens*, great difference of opinion exists as to the continued use of stimulants. Dr. Anstie, whose experience

in this affection was great, expresses a decided opinion to the effect that complete abstinence may always be carried out without any immediate danger to life or health, if proper care be taken to substitute a substantially nourishing diet. In young subjects, therefore, and in first attacks, it is proper to abstain altogether from the use of alcohol. This will be found more difficult with older patients, and with those who have been for a long time accustomed to depend upon strong drinks for a large part of their ordinary nutrition. In every case, however, he thinks it is our duty to abstain as long as possible from the use of alcohol, and before resorting to it to try less harmful narcotic stimulants, especially morphia hypodermically and Indian hemp. (*Op. cit.* p. 91.) When alcoholic stimulants are deemed indispensable, it is advisable to conjoin them with nutritives—*e.g.*, with eggs, in the form of egg-flip, &c. Prolonged experience certainly justifies Dr. Anstie's conclusions.

76. *In Acute Neuralgia*, Dr. Anstie states that he has often observed that after large doses of various narcotics have been tried in vain, the first real and substantial relief has been obtained by the use of a moderate dose of alcohol; in his own person he states that he has more than once experienced this when tormented with an unusually severe attack of neuralgia of the fifth nerve. In these cases extreme caution is needed, as the alcoholic habit is only too readily entered upon.

77. *Convulsions of Dentition.* Dr. Anstie states that there is no other plan of treatment from which he has seen such benefit produced. A minute dose of wine or brandy (for young infants a few drops at a time in a little water) is amply sufficient for any good purpose that can be effected.

78. *In Apoplexy*, when the state of the patient approximates more or less nearly to a state of syncope, the pulse being weak, the aspect pinched and bloodless, and the skin cool, blood-letting is inadmissible, and the treatment most likely to prove successful is the cautious application of warmth to the surface, and the cautious administration of diffusible stimulants, particularly the preparations of ammonia, gr. v. of the carbonate, or fl. drm. ½–j. of the aromatic spirit in water, or camphor mixture.

79. *In Asphyxia from Submersion, Cold, &c.*, it is to stimulants, cautiously employed, that we look for hope of success; warmth (from 90° to 100°) by baths or dried cloths or heated bricks; friction, electricity, the application of stimulant vapours to the nostrils, and of largely diluted diffusible stimulants, as brandy, internally, form the basis of all other treatment. Artificial respiration is an important part of the treatment to be adopted at the same time.

80. *In Cholera*, stimulants were formerly held an indispensable and invariable resource; but of their real value many doubts are at the present day justly entertained. It appears certain that the indiscriminate use of stimulants, especially the more diffusible ones, as brandy, if given in large quantities, and in a concentrated form, so far from being beneficial, is actually injurious.

81. *In Passive Diarrhœa attended with Debility, in the advanced stages of Phthisis, in Chlorosis, in some forms of Atonic Dyspepsia, in Convalescence from Acute Diseases,* and in *other states of Debility,* Dr. Aran[1] speaks highly of the advantages to be derived from the employment of wine in the form of enema; it should be diluted with water, and care taken to prevent a loaded state of the bowels. Dr. Williams[2] relates a severe case of *post-partum Hœmorrhage,* in which port wine enemata exercised the best effects, saving apparently, the life of the patient. He employed it in fl. oz. iv. doses with ♏ xx. of laudanum; three enemata were found sufficient. *In the Vomiting of Pregnancy,* sparkling moselle is productive of the best effects, allaying vomiting, and enabling the patient to retain and digest food.

82. *In Amenorrhœa, Leucorrhœa, and Chlorosis,* associated with anæmia and a depressed state of the system, the regular use of wine and nourishing diet is an essential adjunct to other treatment.

83. *In Pyœmia,* stimulants are almost invariably necessary throughout the case, but the extent to which at any period they should be given requires the nicest judgment. Of all stimulants brandy is the best. Others will often prove useful in particular cases—*e.g.,* carb. of ammonia; but as strong stimulants are least likely to disagree, pure spirit, and above all, brandy, is the best. As the patient recovers, wine is better borne, and should replace brandy partially or wholly. Of wines, good champagne, iced, is often most grateful, even from the commencement, especially when the stomach is irritable. Brandy and iced champagne, either alternately or mixed together, will often remain on the stomach when everything else is rejected. (Mr. Savory.[3]) These remarks apply equally to *Dissection Wounds,* when the attendant fever assumes an asthenic or a dynamic form; the diet should at the same time be nutritive and stimulant.

84. *In Snakebites,* the free use of stimulants is most important; the quantity should be regulated solely by the effects produced. In America, we are told by Dr. Addy,[4] alcoholic stimulants are given to the extent of intoxication—a state which is regarded by the practitioners there as evidence of the effects of the poison being overcome. Of all stimulants liquor ammoniæ is the best, and when injected into a superficial vein in the manner directed by Prof. Halford, its value seems to be enhanced. The quantity required varies according to the severity of the case, from ♏x. to ♏xx. of the strong liquor, with double the quantity of water. No ill effect, local or otherwise, seems to have followed this practice. [See Ammon. Liquor.]

85. *In Chronic Diseases,* stimulants may often be resorted to with advantage, but as a general rule they are not so imperatively called for as in acute diseases, and their use is attended with special dangers. Dr. Anstie[5] has ably pointed out the chronic cases in

[1] Bull. de Thérap. Jan. 15 and 30, 1855.
[2] Brit. Med. Jour. Sept. 4, 1858.
[3] Lancet, Jan. and Feb. 1867.
[4] Dub. Med. Press, March 30, 1859.
[5] Practitioner July 1869.

which there is a marked tolerance of alcoholic stimulants, and furnishes some excellent rules, which should guide us in their use. His remarks are as follows :—1. There assuredly is a marked tolerance of this kind in many cases of *Chronic Debility* which have been induced by one or more copious *Hœmorrhages*. 2. There is a variety of *Pulmonary Phthisis*, especially common in persons with delicate skin and slight frame, with marked tendency to colliquative sweating, and a notable inability to assimilate either ordinary food or fatty matter of any kind, in which the tolerance for large and long-continued doses of alcohol is very remarkable, and the benefit produced by such treatment is very great. 3. In certain *Chronic Neuralgias* of the aged, where the power of digesting ordinary food is nearly suspended by reflex irritation, an almost exclusively alcoholic diet, continued for some time, occasionally works wonders. 4. In certain *Infantile Chronic Diseases*, attended with marasmus and an inability to digest ordinary food, small and frequent doses of alcohol, continued for some weeks, produce a remarkable revolution in the general condition. There are two rules, the observance of which ought to become general, only to be departed from under very special circumstances. One is that alcohol should never be directly prescribed for the relief of chronic pain, convulsion, or spasm during the *self-conscious* period of life; in infancy and early childhood it is quite possible to administer it exactly as one would a medicine, without leaving the faintest trace of a hankering after its illegitimate effects; in the old age of those who have led temperate lives, but have habitually used alcohol, it may also be possible to permit the somewhat freer use of it: but during the whole of that period which corresponds to the sexual life, especially in women, the organism is so exquisitely alive to its own emotions, that the effect of a false step in the direction of narcotic indulgence may be tremendous. A second rule is that never, under any circumstances where it is possible to avoid it, should alcohol be given for the class of maladies we are considering, in larger quantities than those already roughly indicated as the limits of its useful *dietetic* employment in health. There is no true physiological tolerance for it in those cases; even in the instance of severe and agonizing pain, in which large quantities of brandy may be swallowed without any apparent drunkenness, the appearance of considerable quantities of unchanged alcohol in the urine, and the occurrence of after-headache, &c., show that there has been true narcotic poisoning. The relief of such pain (*i.e.*, *Angina Pectoris*, *severe Ovarian Neuralgia*) may be better and more speedily accomplished by the use of ether, or of morphia or atropia subcutaneously injected. And as for the whole series of *Chronic Convulsive Disorders*, and of the mental states which hover between *Hysteria* and *Insanity*, he adds that he is convinced that everything which can be done in a more special direction than that of careful improvement of nutrition can be far better effected by bromide of potassium than by the more liberal use, or as it may be called, abuse, of alcohol.

86. *In Gout*, it is important to decide whether alcohol is ever

to be allowed, and if so, to determine the form which is best adapted for the patient. All malt liquors should be eschewed, as they almost always cause an increase of dyspepsia, and if at all strong, have undoubtedly a very powerful influence in inducing the disease and in keeping up a paroxysm. Strong wines will also prolong an attack to an almost indefinite length of time, and if they are moderately indulged in, will often lay the foundation of the gouty diathesis. The wines to be carefully avoided are port, sherry, madeira, and any in which the fermentation has been checked by the addition of alcohol. If wine is taken at all, that which is best adapted for the majority of patients is a sound claret—one free from sugar and without acidity. When red wine does not agree with the stomach, hock or moselle may be substituted, or even a light and dry sauterne or chablis. The beverage best suited for those of a strongly marked gouty diathesis is undoubtedly French brandy, taken in very limited quantities and freely diluted with water. Whisky, hollands, or gin may in many cases be substituted for brandy; but the last two should be avoided if there is any appreciable amount of kidney disease, or at least should not be taken without advice. The distilled spirits should only be used at the meal, and from one to three ounces may be allowed daily, the amount depending upon the former habits of the individual. If gout has become developed at a very early age, and the youth strongly inherits it, a question arises whether it would not be desirable to advise an entire abstinence from alcoholic drinks, such a step would be most likely to check the future progress of the malady. (Dr. Garrod, i. p. 874).

87. *Nasal Polypi* have been successfully treated by Prof. Miller, of Edinburgh, with a spray of rectified spirit, and the same practice has been extended to *Aural polypi* by Prof. Politzer, of Vienna, and by Dr. P. McBride. The latter directs the instillations to be made twice or thrice daily, after the ear has been carefully syringed; the spirit may be diluted for the first one or two applications, and generally strengthened until it is used pure.

88. *To Wounds and Atonic Ulcers*, alcohol as a local application has found much favour on the Continent. The "spirit lotion" used by Nélaton is "alcool camphré," which closely corresponds with Spt. Camphoræ (B. Ph). Dr. Sée uses pure undiluted alcohol, and Dr. Dolbe the same, diluted with half water. Mr. T. Cooke,[1] who quotes these authorities, prefers a lotion composed of equal parts of methylated spirit and water.

89. Aloe Barbadensis. Barbadoes Aloes. The inspissated juice of the leaf of Aloe Vulgaris.

Aloe Socotrina. Socotrine Aloes. The inspissated juice of the leaf of one or more undetermined species of Aloe. Usually procured from Socotra *viâ* Bombay.

Med. Prop. and Action. In small doses (gr. j.-ij.) aloes acts as a tonic of the alimentary canal, assisting digestion and promoting secretion. In larger doses

[1] Practitioner May 1872, p. 286.

(gr. iii.–vj.) it is a stimulant purgative, its operation being specially directed to the rectum and lower intestines. Its stimulant action, however, is not limited to these, but extends to the neighbouring pelvic viscera, and by stimulating the uterus acts as an indirect emmenagogue. According to Dr. Rutherford, aloes is a powerful hepatic stimulant rendering the bile more watery, but at the same time increasing the secretion of biliary matter. It has been asserted that aloes does not act specifically upon the lower intestines, but that its operation on these parts is due to its slow solubility, its action not being evident until it has passed into and become dissolved in this portion of the intestine; but this view is invalidated by the fact, proved by Gerard and others, that aloes, applied endermically, on a blistered or ulcerated surface, acts as a purgative, producing stools of the same character as when administered internally. As a purgative it is particularly adapted for use in chlorosis, amenorrhœa, and atonic states of the uterine system, in accumulations of fæces in the rectum and lower intestines, and in leucophlegmatic subjects. It has long been a common belief that aloes are capable of producing piles, and that aloes should never be given to hæmorrhoidal subjects; but more recent observations seem to show that in moderate doses, especially when conjoined with ipecacuanha, it is capable, by unloading the rectum of fæcal accumulations, to prove essentially beneficial. Its activity appears to reside in a crystallizable principle, *Aloin*. The testimonies, however, as to its purgative action differ widely. A solution of aloin set aside for some months deposits an uncrystallizable substance denominated "changed aloin." It is stated by Dr. Craig[1] to possess the purgative properties of aloin, and that it may be given by subcutaneous injection or in the form of pills in doses of grs. i.–ij. These pills, he adds, he administered to various individuals in very different circumstances, and in all cases found them a mild but certain aperient. He found them specially useful in the constipation consequent on sedentary life. He administered them also to pregnant females shortly before confinement, and in the puerperal state, and in both states found them answer exceedingly well. In no case was there any griping, nor did any bad result follow.

When aloes is given simply as an aperient, the best vehicle is extract of gentian. According to Christison, sulphate of iron materially increases the purgative powers of aloes; gr. j. of aloes with gr. ij.-iij. of the sulphate producing as much effect as gr. ij.-iij. of aloes alone; at the same time there is less tendency to irritation of the rectum: hence the pill aloes and iron (*infra*) has special claims to notice. Soap, aromatic oils and alkalies are said to diminish its purgative powers. One or two grains of ipecacuanha, combined with each dose of aloes, have the effect of diminishing, and often of altogether removing, its irritating effect upon the anus; and many persons labouring under piles are not only able to take it in this way with impunity, but with advantage. If it produce griping, a few grains of Ext. Hyoscyami may be added. Care should be taken in every case that the aloes be well pulverized. Camphor is said to render the action of aloes more certain and less irritating. Its taste may be disguised by liquorice.

Aloes should be given with caution—(1) to pregnant females; (2) to women suffering from dysmenorrhœa, menorrhagia, or organic diseases of the uterus; (3) to hæmorrhoidal subjects, excepting in combination with ipecacuanha or henbane; (4) during the presence of the catamenia.

90. *Therapeutic Uses. In Habitual Constipation*, aloes rank high in the list of purgatives, especially when this state depends upon atony of the colon, whether this be the result of fever and debilitating diseases, old age, or sedentary habits or occupations. They may be variously combined, as indicated, with quinia, nux vomica, ipecacuanha, &c. *In Habitual Constipation*, Dr. J. Sawyer[2] finds nothing act so efficiently as the following:—℞ Aloes Socot. grs. j.–ij.–iij.

[1] Edin. Med. Journ. May 1875.

[2] Brit. Med. Journ. Nov. 17, 1883.

Ferri Sulph. gr. ¼, ext. hyoscyam. gr. i. M. ft. pil. h. s.s. The quantity of aloes should be regulated so as to obtain one full stool after the morning meal. Aloes properly given may be taken for years, he says, without either losing its aperient efficiency or producing any but the best results.

91. *In the Constipation of Hysteria*, the officinal pill of aloes and assafœtida is most serviceable; and *in the Constipation of Anœmia and Chlorosis*, the pill of aloes and iron, or aloes and myrrh, or the decoction of aloes with the simultaneous use of pills of iodide of iron, often produce excellent effects. *In the Constipation of Chronic Mania*, aloes is highly spoken of by Prof. Van der Kolk. He considers that he has seen injury from it in large single ordinary doses, in place of which he directs gr. xv. of the aqueous extract to be combined with gr. v. of tartar emetic and some bitter extract, and to be divided into 60 pills; of these from two to four are to be taken four or five times a day. In time even these doses cease to be well borne, and the quantity must be gradually diminished, until at last the remedy is no longer needed. When constipation alternates with watery stools, he substitutes sulphate of copper for tartar emetic, and the combination may be continued for months together with advantage. If spasm co-exist, he adds belladonna, which increases the activity of the aloes, so that the dose of the latter may be decreased. When a thickly coated tongue indicates a special irritation of the mucous intestinal canal, he directs aloes to be conjoined with chloride of ammonium; by the use of which, he states, this appearance usually vanishes within a few days. In this combination tartar emetic is to be omitted.

92. *In Dyspepsia*, occurring in persons of a relaxed habit, or in those who have been debilitated by long illness, particularly if there is reason to believe the duodenum to be implicated, a combination of aloes (gr. ij.–iv.) and ipecacuanha (gr. j.–ij.) twice or thrice a week, is often attended with benefit. It has been found serviceable also in *Jaundice*. *For the removal of Thread-worms* from the rectum, an enema of decoction of aloes is often effectual.

93. *In Amenorrhœa*, a small enema containing aloes (gr. x.) employed at the proper menstrual period, is spoken of by Schönbein as more certain in its operation than any other emmenagogue. Dr. Ashwell[1] tried this practice in two or three cases with decided advantage. Aloes may also be advantageously given internally in the form of Pil. Aloes et Myrrh, together with Mist. Ferri Co. Dr. Tilt advises a combination of aloes and podophyllin.

94. *In Congestive Headaches, and other cerebral affections arising from suppression of hœmorrhoidal discharge*, or in persons of a phlegmatic habit, aloetic purgatives are indicated and often prove beneficial. Conjoined with nux vomica, they may also prove useful in *Paralysis*.

95. *In Chronic Urticaria*, Sir E. Wilson, states that he has derived the greatest benefit from aloetic purgatives combined with citrate of iron, or nitro-hydrochloric acid in a bitter infusion. *In*

[1] Med. Times, Nov. 12, 1870.

Fissures and Excoriations of the Skin caused by Lichen Agrius, Eczema, &c., M. Chausit[1] speaks highly of the healing powers of the glycerine of aloes formed by evaporating from 4 to 8 parts of the tincture of aloes, and incorporating the residuum with 30 parts of glycerine. In some cases in my own practice it acted beneficially. *To Bed Sores and Indolent Ulcerations*, M. Delioux[2] found a solution of aloes (1 part) in alcohol (2 parts) a very efficient application. Mr. H. Wattan[3] testifies to the value of Vinum Aloes as a local application in *Ulceration*. It should be applied on lint, covered with oil-silk, and each dressing should remain on twenty-four hours.

96. ALUMEN. Alum.

ALUMEN EXSICCATUM. Dried Alum.

Med. Prop. and Action. Alum is astringent and styptic, whether employed internally or externally. Its local effects depend upon a chemical action on the albuminous and gelatinous constituents of the tissue. When administered internally, it is absorbed into the system, and has been detected in the liver, spleen, and urine. "After its absorption," says Pereira, "alum appears to act as an astringent on the system generally, and to produce, more or less, general astriction of the tissues and fibres, and a diminution of secretion." Its astringent influence is chiefly directed upon mucous surfaces; applied locally to relaxed or bleeding surfaces, it constricts the surrounding tissues, and causes contractions of the capillaries; in this manner it arrests the discharge, and acts as an astringent. In large doses, ʒj. and upwards, it has been used as an emetic, but it does not seem to possess any advantage over better known articles of the same class. For internal use it is best given reduced to fine powder and incorporated with honey or treacle in the form of electuary; the addition of cream of tartar is said to prevent its causing constipation. Thus given, the effects of the medicine soon evidence themselves. (Sir J. Murray.)

Another mode of administering alum is in the form of whey, which is made by boiling gr. cxx. of powdered alum for a few minutes in Oj. of milk. A teacupful of this thrice daily is a popular astringent and tonic in many parts of England. The Liq. Aluminis Co. (Alum. Zinci Sulph. āā ʒj. Aq. Ferv. Oiij.) is an excellent form for injections, collyria, &c.

Dose of Alum, gr. x.-xx. Dried alum is only used externally as an astringent and mild escharotic.

97. *Therapeutic Uses. Diseases of the Abdominal Viscera. In Colica Pictonum*, alum has long been held in high repute, and since its introduction from Holland by Dr. Percival, in 1774, it has been extensively employed. The theory of its action is, that it converts the poisonous salt of lead in the system into a comparatively innocuous sulphate. Dr. Brachet employed it in 150 cases with complete success, giving ʒiss.–ʒij. daily, with gutt. xl.–l. T. Opii, and with an occasional dose of castor or croton oil to procure one or two motions daily. It may be advantageously combined with sulphuric acid, as advised byBriquet.[4] ℞ Alum ʒj., Acid Sulph. ʒj., Aq. lb. iv. M. This, sweetened to the taste, should be drunk during the day. To this he added gr. j. of opium at bedtime, and sulphurous baths.

98. *In Chronic Dysentery*, I have often seen benefit from it in

[1] Gaz. de Hôpitaux, 1857.
[2] Bul. de Thérap. vol. lxvi. p. 24.
[3] Med. Times, vol. xii. 1870.
[4] Bul. de Thérap. vol. liii. p. 97.

doses of gr. xxx. daily, in conjunction with Dover's powder, in the asthenic dysentery of Asiatics.

99. *In Diarrhœa dependent upon a relaxed condition of the intestinal mucous membrane*, alum, gr. xxx.–xl. daily, often proves beneficial. It may be given as follows:—℞ Alum, gr. x., Pulv. Kino Co. gr. v., Conf. Rosæ q.s. Ft. pil. sextis horis sumend. Benefit has also been found from alum (gr. x.–cxx. according to age) administered in the form of enema. *In the Diarrhœa of Typhoid Fever*, alum proved very effectual in the hands of Fonquier, of Paris.[1]

100. *In Catarrhal Affections of the Stomach*, Sir J. Murray speaks in the highest terms of alum. In one aggravated case, attended with *Pyrosis*, a complete cure was effected by alum in electuary (*ante*), in doses of gr. xxij. thrice daily. He considers that it renders the mucous coats more firm, and restores their tone and strength.

101. *In Prolapsus of the Rectum*, the injection of a solution of alum (gr. lx.–gr. cxx. ad Aq. fl. oz. viij.) proves serviceable. It may also be used with advantage in *bleeding and painful Piles*, when unattended by inflammation.

102. *Affections of the Mouth, Throat, and Fauces. In Stomatitis and Catarrhal Affections of the Throat*, the local application of alum is very serviceable. In chronic cases, when the mucous membrane is much congested, and covered with mucus, which gives rise to a troublesome cough, alum gargles (gr. lx. ad Aq. fl. oz. vj.) afford great relief and benefit.

103. *In Ulcerative Stomatitis*, alum, either used as a powder or in the form of a wash, will generally be found quite sufficient; but if the ulcers be slow to heal, they should every now and then be cauterized with nitrate of silver (Dr. Squarey).

104. *To Enlarged Tonsils*, Morell Mackenzie speaks of powdered alum as one of the most effective astringent applications, applied by means of the pharyngeal spatula. This he regards as better than insufflation.

105. *In Croup*, alum is commended by Prof. Meigs[2] as an emetic, in preference to antimony or ipecacuanha. He states that it acts more speedily and certainly than these medicines, and produces less prostration of the vital powers. The dose (gr. xxx.–gr. lx.) is to be mixed with a teaspoonful or two of water, and repeated every ten or fifteen minutes, until it produces a full emetic effect. It is rarely necessary to repeat it.

106. *In Ulceration and Relaxation of the Throat*, a solution of alum in water or decoction of cinchona (gr. lx. ad Aq. fl. oz. xij., sweetened with honey), proves a very useful gargle for ordinary cases. Insufflation of finely powdered alum has also been attended with good effects. *In Chronic Laryngitis*, a solution (gr. j.–x. ad Aq. ℥j.) may advantageously be used in the form of spray.

107. *In Ptyalism and in Ulceration and Sponginess of the Gums, whether Mercurial or Scorbutic*, the lotion advised in the last section, with the addition of T. Myrrhæ fl. oz. ss., will prove useful. It should be used several times daily. *As a means of preventing the*

[1] Bul. de Thérap. vol. ix. p. 301. [2] Med. Times, vol. xvi. p. 416.

occurrence of salivation under prolonged courses of mercury, Dr. T. J. Walker[1] advises that the patient should suck a small piece of alum every hour or two for two or three minutes at a time.

108. *Diseases of the Genito-urinary Organs. In Gonorrhœa and Gleet*, the injection of a solution of alum (gr. ij.–iv. ad Aq. fl. oz. j.) is often productive of benefit. The diluted Liq. Alum. Co. v.s. (one part to six or eight of water) is also a good formula. In obstinate cases, it may be advantageously administered internally combined with cubebs. *In Gonorrhœa Præputialis*, a solution of alum (gr. lx. ad Aq. fl. oz. j.) injected beneath the prepuce, or applied on lint to the glans penis, is generally effectual.

109. *In Leucorrhœa*, alum combined with Pil. Aloes Co. proves serviceable. It may be given in doses of gr. viij. thrice daily. It also forms, with sulphate of zinc (Liq. Aluminis Co.) an excellent vaginal injection. The decoction of oak bark also forms a good vehicle (Alum gr. lx. ad Decoct. Oj.). Dr. Dewees states that in some obstinate cases he has effected a cure by alum (gr. v.) and nitre (gr. x.) thrice daily. The injection found most serviceable by Dr. Tyler Smith is as follows:—℞ Alum Sulph. ℥ss., Tannin ʒj.–ʒij., Aq. Oij. M. One-half to be used at night and the other in the morning. Dr. Graily Hewitt (p. 398) reports favourably of this injection. Some caution, however, is necessary in these cases. Dr. Tilt states that he has repeatedly known the prolonged use of alum injections produce an irritable sub-inflammatory state of the cervix uteri; and he advises that, when astringent injections are long required, those of alum and zinc and of acetate of lead, should be used on alternate days. Dr. L. Atthill[2] takes exception to vaginal injections containing alum, on the ground that they coagulate the albumen, which enters so largely into the composition of leucorrhœal discharges. If you examine a patient, he remarks, any time within twenty-four hours after she has used an alum injection, you will find in the vagina a number of hard masses formed by the coagulation of the discharge, and these often cause much discomfort. In this respect, alum is inferior to borax (*q.v.*). *In the Vulvitis of Children*, few remedies, according to Dr. Ringer (p. 231), can be compared to a solution of alum (gr. lx. ad Aq. Oj.), used as an injection, and as a wash kept constantly applied to the external parts. Like other remedies, however, it often fails. This Dr. Ringer considers is often due to the lotion not reaching the vaginal surface: here injection is necessitated. Should the solution be too strong, increasing the inflammation and discharge, its strength should be reduced.

110. *In Menorrhagia and Uterine Hæmorrhage*, alum administered internally often proves effectual in controlling the discharge. Dr. Tilt states that, in uterine hæmorrhage, alum given in solution with sulphuric acid is the first remedy to try, and that it often suffices. In purely atonic cases, alum in solution (gr. lx., Decoct. Querc. Cort. Oj.) may be used as a vaginal injection. It is inadmissible if any inflammatory symptoms are present.

[1] Brit. Med. Journ. July 10, 1869. [2] Med. Press, Dec. 31 1873.

111. *In Morbid Growths and Ulcerations of the Uterine Cavity, or of the Os Uteri*, an alum hip-bath (lb. j. Alum ad Aq. Cj.) is strongly advised by Dr. Ashwell, and its utility is confirmed by the reports of Delmas, Récamier, and others. Care should be taken that the fluid passes well up into the vagina. *In Prolapsus Uteri*, the same measure is sometimes attended with good effects.

112. *In Hæmaturia*, alum internally (gr. x.–xv. every four to six hours) and in solution (gr. xx., Aq. Oj.), injected into the bladder, was favourably noticed by Dr. Prout and others; but its efficacy is doubtful. *In Catarrh of the Bladder*, it is highly spoken of by Sir J. Eyre, in doses of gr. x.–xv. thrice daily. *In Albuminuria*, Oppolzer has recommended alum, the trials of which by Heller seem to have been satisfactory. (Dr. W. Roberts.)

113. *In Ophthalmic Practice*, Alum Collyria are largely employed (gr. iv.–vj. to Aq. ʒj.); but Prof. John Tweedy points out that alum preparations are really deleterious, on account of the powerful disintegrating action alum exercises upon protoplasm.

114. *Hæmorrhagic Diseases.* The value of alum in Menorrhagia and Hæmaturia has been already considered. It likewise proves serviceable in purely *Atonic Hæmoptysis.* When of tubercular origin, and the hæmorrhage is moderate but persisting, the following formula is advised by Dr. Symonds:[1]—℞ Alum gr. v., Acid Sulph. Dil. ♏xx.–xxx., Mag. Sulph. gr. x., Aq. ʒx. M. Repeated every three hours, or oftener, as required. Alum in substance, or alum lozenges, allowed to dissolve slowly in the mouth, are also adjuncts of some value in these cases. *In Atonic Hæmatemesis*, alum in doses of gr. viij.–xij. thrice daily, in combination with opium, proves serviceable, although it is of inferior efficacy to the acetate of lead. *In profuse Atonic Epistaxis*, the injection of a solution of alum (gr. cxx. ad Aq. fl. oz. vj.) into the nostrils often proves effectual in arresting the discharge. *In Hæmorrhage from leech-bites, in that from the gums after the extraction of a tooth, and in other superficial Hæmorrhages*, a saturated solution, or dried alum, locally applied, acts as an effectual styptic.

115. *Other Diseases. In the Chronic Stage of Hooping-cough*, no remedy is more generally efficacious than alum, in doses of gr. iij.–iv., every four or six hours, for a child from one to two years old. It may be given in either of the following forms:—℞ Alum gr. xxv., Ext. Conii gr. xii., Aq. Anethi fl. oz. iij. M. Dose, a dessert-spoonful every four or six hours for a child æt. two to four years (Dr. Golding Bird); or, ℞ Alum gr. xxiv., Acid Sulph. Dil. ♏xij., Syr. Rhœad. fl. drm. iv., Aq. fl. oz. ijss. M. Dose, fl. drm. iij., sextis horis (Dr. West). One of the advantages of alum is that it may be commenced, without prejudice, earlier in the disease than most remedies of the same class.

116. *In Chronic Skin Diseases* attended with much discharge, benefit sometimes results from a solution of alum (ʒj. ad Aq. ʒvj.), to which opium may be added, should it cause much irritation. *Indolent and Scorbutic Ulcerations* and *Fungous Granulations* im-

[1] Brit. Med. Journ. June 13, 1868.

prove under the application of dried alum; but as it is apt to cause much pain, it may be used in the form of ointment, with the addition of opium. Powdered catechu is often a valuable adjunct. Used thus, it is thought to hasten the process of cicatrization. *In Scorpion-bite*, alum, moistened with water and locally applied, affords in many instances instantaneous relief. (Dr. Saunders.)

117. *To Chilblains*, an alum poultice is stated to be an excellent application. It is only admissible in unbroken chilblains.

118. Ammonia.

The vapour of ammonia is powerfully irritant; if inhaled, it produces spasm of the glottis, and death results from asphyxia. The diluted vapour causes much irritation of the lining membrane of the bronchial tubes, and also that of the mouth and nose. It is also a powerful nervine stimulant, as is best seen in the application of the vapour in *Syncope*. Ammonia is the basis of the following preparations.

119. Ammoniæ Acetatis Liquor. Solution of Acetate of Ammonia.

Med. Prop. and Action. Refrigerant and diaphoretic in doses fl. drm. ij.-vj. Its action appears to be much increased by combination with other remedies of the same class. Externally it is occasionally used as a lotion to sprains.

120. *Therapeutic Uses. In Febrile and Inflammatory Affections and Exanthemata*, few medicines are in more general use than Liq. Ammon. Acet. conjoined with Sp. Ætheris Nit., Ant. Tart., &c., and ordinarily it seems beneficial, but it may admit of a doubt whether the routine practice in all cases is a desirable one. *In Catarrh and Influenza*, a combination of Liq. Ammon. Acet. and Nitric or Chloric Ether is often of great service. Dr. Broadbent[1] considers that by a draught such as this given at the outset of a catarrh, and repeated hourly—*e.g.*, at eight, nine, and ten P.M., instead of, as is usual, every three or four hours—we may often cut short an attack which otherwise would go for days. *For the Coryza of Childhood*, Dr. West (p. 290) supplies us with the following useful formula:—℞ Liq. Ammon. Acet. ʒj., Vin. Ipecac. ♏xvj., Pot Nit. gr. viij., Mist. Amygd. ʒvij. M. Dose, fl. drm. j. every four hours for a child æt. six months.

121. *In Sick Headache*, few remedies are so successful as a teaspoonful or two of this solution (Stillé). The same dose, repeated in a few minutes should the first be vomited, is reported by several German physicians quoted by Stillé (ii. p. 524) to be very effectual in speedily putting an end to the phenomena of *Drunkenness*.

122. *To Sprains, Bruises, Glandular Enlargements*, it is occasionally used as a lotion, and Dr. A. T. Thomson speaks highly of it as a local application in *Porrigo of the Scalp*.

123. Ammoniæ Benzoas. Benzoate of Ammonia.

Med. Prop. and Action. Diuretic and stimulant of the mucous membrane of the urinary passages. Its action is that of Benzoic Acid (*q.v.*), but it is preferable on account of its greater solubility. It renders the urine acid and

[1] Practitioner, Feb. 7, 1877.

irritating, its benzoic acid being converted into hippuric acid, in which state it is eliminated by the kidneys. It exercises no influence on the formation or secretion of uric acid.

Dose, gr. x.-xx.

124. *Therapeutic Uses.* Similar to those of Benzoic Acid (*q.v.*)

In Chronic Inflammation of the Bladder, Dr. Garrod has found much benefit from its employment. It is of considerable service where a tendency to phosphatic deposit exists.[1]

125. *In Ascites connected with Atrophy of the Liver*, Dr. Murchison (p. 257) states that the benzoate of ammonia (gr. x.–xx.), as well as the muriate, sometimes proves useful as a diuretic, and may be advantageously combined with taraxacum.

126. *In the advanced stages of Scarlatina, when Albuminuria and Hæmaturia are present*, the benzoate (gr. v.) has been recommended, and Dr. Hillier (p. 319) states that it has sometimes appeared to him to exert a good effect. Dr. A. D. Macdonald[2] states that in doses of gr. xv. every three or four hours for adults, and proportionately for children, he has found the benzoate efficient in the treatment of scarlatina anginosa and milder forms, combined or not with Liq. Ammon. Acet. He regards it as a germicide.

127. Ammonii Bromidum. Bromide of Ammonium.

Med. Prop. and Action. Bistroff (Archiv für Anat. 1868, quoted by Wood, p. 341) found in frogs bromide of ammonium produced at first a period of quiet; this was followed by violent tetanic convulsion. Later, all excitability is lost. The total abolition of reflexes and loss of all sensibility occur at the same time with violent spasms. The animals died from asphyxia. Dr. Amory of Boston found much the same conditions obtained for the smaller mammals. Peripheral motor apparatus seems little affected. The heart also seems to escape. Dr. Gibb finds that as an absorbent in glandular and other enlargements it assimilates to but is not inferior to the bromide of potassium (*q.v.*). It appears to exercise a beneficial effect in a number of diseases in which the ganglionic nervous system is functionally engaged. It also exercises a marked control over the mucous membranes of the entire body, and especially appears to deaden the sensibility of the fauces and palate. According to Dr. H. Purdon,[3] the first action of the bromide is to quicken the pulse, and when given in large doses, to act as a powerful anodyne, occasioning sleep and increasing the secretions.

Dose, gr. ij.-xx. thrice a day.

128. *Therapeutic Uses. In Hooping-cough*, Dr. Gibb[4] has found it of great value. He finds that many cases may be readily cured by it. If there is a tendency to bronchial or pneumonic inflammation, he recommends that it be combined with ipecacuanha wine. It appears to control the special nervous symptoms of the disease rather than the catarrhal. The spasms diminish in frequency and severity, and the whoop is not so frequently heard. He has a greater faith in the permanent effects of nitric acid, but thinks the bromide of ammonium worthy of a more extended trial. The dose of the bromide for infants is gr. ij. or iij. three times a day. For older children gr. iv.–viij., or gr. x. when the symptoms are very severe.

129. *In Syphilis* the bromides of ammonium and potassium are

[1] Med. Times and Gazette, Feb. 6, 1864.
[2] Brit. Med. Journ. Feb. 10, 1883.
[3] Journ. of Cutaneous Med. Oct. 1867.
[4] Lancet, Sept. 26, 1863, p. 365.

used either alone or conjoined with Pot. Iod. They are serviceable where the system has become insensible to iodine, or in *Syphilitic Epilepsy and other varieties of Nervous Excitement.* (Hill and Cooper, p. 430.)

130. *In Epilepsy,* Dr. Gibb has prescribed it with the effect of arresting and diminishing the number of fits.[1] *In Vertigo,* from overwork in the well-fed, where there is usually restlessness, insomnia, depression of spirits, with a sense of impending evil, Dr. Ramskill (ii. p. 152) states that he has found great help from the bromide given in an effervescing form with cascarilla. *In Delirium Tremens,* it has been employed by Dr. Peacock[2] with very good results.

131. *In Strumous Ophthalmia,* its effects are sometimes beneficial and decided. In *Conjunctivitis, Corneitis,* and *Leucoma,* opacities are found to diminish under its use. (Gibb.)

132. *In Glandular Enlargement* and *Atheroma,* it has been thought to promote the absorption of the morbid deposit. *In Corpulency,* the adipose tissue is lessened, and the secretion from the oily sudoriferous glands is modified and diminished. (Gibb.)

133. *In Prurigo,* Dr. H. Purdon found great benefit from the bromide in doses of gr. x., gradually increased to gr. xx., thrice daily, the only local application being the glycerine of borax.

134. Ammoniæ Carbonas. Carbonate of Ammonia. Volatile or Smelling Salts. Salts of Hartshorn.

Med. Prop. and Action. Antacid, stimulant, diaphoretic, and expectorant. It is preferable to all the other alkaline carbonates in cases where the vital powers are much depressed. Its diaphoretic powers are very marked. According to Ringer (p. 205), a small dose (gr. i.-ij.) given hourly, generally produces perspiration as abundantly as either aconite or antimony; hence its usefulness in fevers. It is emetic in doses of gr. xxx.; in larger doses it causes colic, convulsions, and great disturbance of the nervous system. If taken for a long period, it occasions much itching of the scalp, and the skin generally. In inducing it is said a liquid state of the blood, and in other respects, it resembles the other salts of ammonia. It is very valuable as "smelling salts" in *Syncope, Hysteria,* and *Asphyxia.* It is occasionally used for making effervescing draughts: 20 grs. of the carbonate = 6 fl. drs. of lemon-juice = 24 grs. of citric acid = 26 grs. of tartaric acid. The two former, the citrate of ammonia, and the latter, the tartrate, are very useful refrigerants in febrile attacks and in gastric irritation.

As a stimulant and diaphoretic gr. iij.-x.; as an emetic gr. xxx.

135. *Therapeutic Uses. Acidity, Heartburn, Flatulence.* In these affections, particularly when occurring in cases of atonic dyspepsia or in hysterical females, the carbonate, in doses of gr. v.–viij. in some aromatic water or mild bitter infusion, proves very efficacious.

136. *Asthma.* In forms of asthma arising from or connected with disease of the heart, Dr. Hope states that he has derived more benefit from this salt, in doses of gr. x.–xv., than from any other remedy. In a very obstinate case, which resisted all other medicines, the following formula afforded great relief:—

[1] Lancet, Jan. 3, 1883, p. 11. [2] Brit. Med. Journ. July 3, 1869.

℞ Ammon. Carb. gr. viij., Antim. Tart. gr. ¼., Aq. Anisi fʒiss. M. ft. haust., alternâ horâ sumend.

137. *Cancrum Oris.* Mr. Wallace[1] states he has seen some very severe cases of cancrum oris cured by the internal use of the carbonate, in doses of gr. v., gradually increased to gr. x.–xx., every two or three hours, according to the severity of the symptoms. He advises the strong nitric acid as a local application at the same time. A liberal diet should be allowed.

138. *In Diabetes Mellitus*, carb. of ammonia was brought forward by Dr. Barlow as a remedy of great efficacy, which subsequent experience has failed to confirm. It is not, however, without value as an adjunct to other treatment. Dr. Basham[2] speaks highly of the following formula:—℞ Ammon. Carb., Ammon. Phosphat., Sodæ Bicarb, āā gr. x., Tinct. Zingib. x.–xv., Aq. ʒi, M. To be repeated twice daily in a state of effervescence, with a table-spoonful or more of fresh lemon juice. This is grateful to the patient, relieves thirst, and mitigates morbid appetite. At the same time the quantity of urine diminishes, with a marked fall in the proportion of sugar contained in it.

139. *In Pneumonia*, when antimony in small doses is not indicated, Dr. Waters speaks highly of a combination of ammonia and chloroform, ℞ Ammon. Carb, gr. iv., Spt. Chloroformi ♏xx., Aq. Camph. ʒx. M. 3tis vel 4tis horis sumend. They may be given as required either with or without alcoholic stimulants. *In Gangrene of the Lungs*, it is one of the remedies most to be relied upon; it is best given in Decoct. Cinchonæ. *In Bronchitis*, except in the earliest stages, and when recent febrile action is present, the above formula often produces excellent effects. It may be often advantageously combined with ipecacuanha, squill, &c., when expectoration is scanty or difficult, or with T. Lobeliæ, if much spasm is present. In the advanced stages, infusion of senega may advantageously replace the camphor water as a vehicle. It appears peculiarly adapted for the *Asthenic Bronchitis of old age*. It likewise proves useful in *Catarrhal Affections*. *In the Coughs of Childhood*, when stimulant expectorants are indicated, the following formula of Dr. Hillier's may be tried:—℞ Ammon. Carb. gr. viij.-xij., T. Scillæ ♏xx., Syrup ʒij., Decoct. Senegæ ad ʒij. M. Dose: two teaspoonfuls for a child three years old. Dr. Melens[3] having observed the good effects of the atmosphere of a stable on those suffering from pulmonary diseases, and attributing this to the ammoniacal emanations, thought that the continued yet moderate respiration of this vapour might prove serviceable in *Bronchitis and other Diseases of the Chest*. Hence he was led to the use—suspended round the neck—of satchets or small bags containing pieces of the carbonate, which, in his own person and in others, proved very beneficial in relieving the cough.

140. *In the advanced stages of Croup*, this salt has been prescribed as a stimulant, expectorant, and occasionally as an emetic, in order to promote the discharge of effused matter. When the

[1] Dublin Hosp. Reports, vol. iv.
[2] Guy's Hosp. Reports, 1870, p. 293.
[3] Med. Press, Oct. 18, 1882.

patient is greatly debilitated, it may prove useful, but some caution is necessary in its use.

141. *In Chorea*, it is favourably mentioned by Dr. Radcliffe, who states that he has tried it in several cases, singly and in combination, with eminently satisfactory results. *In Epilepsy*, though it has no claim as a curative agent, it often proves very valuable as a palliative. Pereira speaks very favourably of it in large doses (gr. x.–xx. for an adult), especially in the hysterical form of the disease. Dr. Anstie (p. 130) states that where there is time to administer a dose previous to an impending attack, it is often effectual in warding it off, and this is in accordance with the experience of others. *In Hysteria*, the carbonate and the other preparations of ammonia are of great value.

142. *In Diseases of the Skin. In Lepra and Psoriasis*, M. Cazenave successfully employed this salt, in doses of gr. v., gradually increased to gr. xxiv. daily. In somewhat larger doses (gr. x. gradually increased to gr. xxx.–xl.), given largely diluted, it is the alkali from which Dr. M'Call Anderson states that he has derived most benefit in *Psoriasis*. Sometimes, he remarks, it may be advantageously combined with arsenic, or with colchicum if there be a gouty tendency. *In Erysipelas, occurring in debilitated subjects*, it proves highly useful. Sir T. Watson (ii. 833) observes that, after a preliminary purgative, he commences the use of this salt, and that, generally speaking, a large proportion of the cases recover. It is also strongly recommended by Mr. Wilkinson.

143. *In Scarlet Fever*, carbonate of ammonia ranks highest in our list of remedies; it is certainly one of the most reliable medicines, and has the commendations of most of the best modern authorities. Strong evidence of its efficacy is adduced by Mr. Wilkinson, Dr. C. Witt, Mr. Camden, and others. Mr. Milton ranks the introduction of this remedy as amongst the most striking triumphs of modern medical discovery. From gr. iij. to gr. vj.–vij., according to the age of the patient, may be given at first every hour or two till a decided effect is produced upon the disease, after which it may be given less frequently. Camphor mixture, or cinnamon water, or milk, are the best vehicles. *In Scarlatina*, Mr. Milton remarks, the success has been marvellous; and its success in *Small-pox*, he adds, is equally cheering.

144. *In Rubeola, Urticaria, Roseola, Erythema*, and in other diseases of the same class, Mr. Wilkinson also bears witness to the value of the carbonate. He states that for seventeen years he has administered this remedy as advised in the last section, and that he has not only never lost a patient in the above diseases, but has never had a case of the kind that has ever appeared dangerous, or that has given him a moment's anxiety. *In Erysipelas*, he found it no less successful; and in this disease, and also in *Urticaria*, the lotion originally proposed by Peart may be employed with advantage to allay the irritation of the surface. ℞ Ammon. Carb. ʒj., Plumb. Acet. ʒj., Aq. Rosæ fʒviij. M. ft. lotio.

145. *In Acute Glanders*, it proved successful in a case under

the care of Mr. Wilkinson. The treatment employed is thus summed up :—1, An incision into each of the Whartonian ducts; 2, an emetic of ipecacuanha; 3, carbonate of ammonia in water, hourly, as concentrated as it could be swallowed; 4, an opiate at bedtime, with wine and nourishment in such quantities as the patient could be prevailed upon to take. He places great stress upon the ammonia having been given in a concentrated form.

146. *In Mercurial Erethism*, no internal remedy is more to be trusted than the carbonate in conjunction with camphor and other stimulants.

147. *In Drunkenness*, after the stomach has been emptied, the carbonate may be given internally with advantage. Its application to the nostrils is also beneficial. It also is a valuable tonic, checking drink-craving and removing the intense feeling of depression following withdrawal of alcohol.

148. *Cystine in Urine.* Dr. Lionel Beale[1] finds large doses of the carbonate most successful in grappling with this disease.

149. Ammonii Chloridum, Chloride of Ammonium. Ammoniæ Hydrochloras, Hydrochlorate of Ammonia, Sal Ammoniac.

Med. Prop. and Action. Given in scruple doses three times a day, according to Dr. Murchison,[2] this salt acts as a diaphoretic and diuretic, and exercises a powerful influence in relieving the portal circulation. It is not oxidized, but passes out of the system unchanged in the urine. According to Böcker's experiments, it increases the nitrogenous solids of the urine; the mean daily increase of urea under its use he found to be not less than 74 grains—a quantity indicating a vast augmentation either of metamorphosis or of elimination, but from its beneficial effect on the liver, most probably the former (Dr. Murchison). From Dr. Rutherford's[3] experiments on dogs it was not found to stimulate the liver, but this must not be taken as proof that it does not thus operate in man. From some interesting experiments with this salt, Dr. A. Lindsay[4] considers that it is deserving of a high place amongst our more valuable alterative, resolvent, and liquefacient remedies. From the relief which it affords in certain neuralgic affections, it deserves a place amongst the anodynes; and there is reason to believe that it possesses some power as an emmenagogue and a cholagogue. Dr. Anstie[5] characterizes it "a pure tonic stimulant to sensitive nerves, raising them to a level of tense vitality *too high* for the explosive perturbations which, when carried to the brain, are translated as *pain*, and to the vaso-motor system, directly inciting to a superior tone of the systemic vessels, which puts an end to that exaggerated passive congestion of viscera which is known to be fatal to the healthy performance of the function of secretion. In overdoses it acts as an irritant poison. Externally, it is used as a cold lotion in *Fevers*, *Hernia*, &c. Sir A. Cooper's formula was—Pot. Nit., Ammon. chlor. āā ʒv., Aq. f. ʒxvj. M. It is also used as a gargle (oz. ss. ad Aq. fl. oz. xij.)

Dose: gr. v.–gr. xxx. in solution, repeated every two to six hours. The addition of liquorice serves to disguise the taste.

150. *Therapeutic Uses. Abscess of the Mamma. Milk Abscess.* The following lotion, originally prescribed by Jastamond, has been found in many cases of great service :—℞ Ammon. Chlor. ℥j., Spt.

[1] Lancet, 1884, p. 363.
[2] Brit. Med. Journ. May 2, 1874.
[3] Practitioner, Nov. 1879.
[4] Glasgow Med. Journ. 1856.
[5] Practitioner, Dec. 1868.

Rosmarini Oj. M. Linen rags, wetted with the lotion, to be kept continually to the part. It is chiefly applicable in cases of induration of the mamma, after the abscess has suppurated. *In other Glandular Enlargements* and *Incipient Abscesses*, it is a very valuable application, and Dr. Lindsay found *Indolent Bubo* speedily subside under the application of a hot solution (℥ij. ad Aq. f. ℥j.).

151. *Aphonia* arising from cold is benefited by inhalations of chloride of ammonia. The value of inhalations of chloride of ammonium vapour in this class of cases is attested by Dr. Beigel,[1] who obtained excellent results from it in several cases. The results of five years' experience with the use of the chloride in the form of inhalation in the treatment of *Chronic Affections of the Air Passages* are embodied by Dr. Libermann in a pamphlet (Paris, 1873). For an abstract of this see "Brit. and For. Med.-Chir. Rev.," April 1874, p. 518.

152. *Ecchymosis of the Eye*, vulgo *Black Eye*. A very good application is the chloride in solution, mixed with bread or linseed, so as to form a soft poultice (Tyrrell). It tends to prevent subsequent discoloration in all cases of *Bruises and Sprains*.

153. *Face Ache. Tic Douloureux. Rheumatic Affection of the Face.* Sir T. Watson states that he has found the chloride in doses of ℥ss., repeated four times daily, of great service in numerous cases, particularly when the pain partakes more of a rheumatic than of a neuralgic character. It does not always succeed, he adds, but it often does. If the pain does not yield after four doses, you may cease to expect any benefit from it. Dr. Ebden[2] has found it most successful in many cases; and my own trials with it have been most satisfactory. *In other forms of Neuralgia*, its use is often attended with benefit. Dr. D. Young, of Florence,[3] considers that in neuralgia, if the chloride be administered at distant intervals—*e.g.*, every three or four hours—the effect is much less marked than when given rapidly (gr. x. every hour) and in anticipation of the onset. Dr. Anstie speaks highly of it in the *Intercostal Neuralgia often observable in suckling women and phthisical patients*, in the milder cases of *Sciatica*, occurring in the young, in *Hepatalgia* and *Ovarian Neuralgia*. The dose (gr. x.–xv.–xx.) may be repeated every three or four hours till relief is obtained. Under the name of the *Facial Neuralgias of the Young*, including under this term what is often described as *Bilious and Hysterical Headaches*, Dr. Anstie states that the chloride (gr. x.–xx.), if given early enough, seldom fails to cut short or greatly to mitigate the attack. It is especially useful in attacks occurring in hard-worked and delicate young females. With regard to its use in various forms of *Nervous Headache*, Dr. Barrallier[4] found that it constantly dissipates fits of *Idiopathic Headache, Headache consecutive on menorrhagia, Headache dependent on functional derangement of the stomach*, and *that supervening upon fevers;* whilst it is powerless to relieve hemicrania dependent on irregularity or suspension of menstruation. By

[1] Practitioner, Aug. 1868.
[2] Ind. Ann. of Med. Science, April 1854.
[3] Practitioner, Dec. 1875.
[4] Bull. Gén. de Thérap. April 15, 1859.

others, however, it has been found of great service in the headache which accompanies amenorrhœa. It is only useful if given when the pain is most intense.

154. *In Amenorrhœa,* it is highly spoken of by Sundelin and other German writers. Dr. Anstie (*op. cit.*) states that, given in gr. x. doses thrice daily, in cases of amenorrhœa, marked rather by general feebleness than by anæmia, it has occasionally seemed to him to conduce directly and considerably towards the cure. He adds the just remark: "But of this, as of all other emmenagogues, it is pre-eminently true that they are worth absolutely nothing, unless used precisely at the fit occasion."

155. *In Enlarged Prostate,* the chloride internally (gr. xv.–xxx., three or four times daily) is occasionally useful. M. Vanoye[1] relates two cases cured by it.

156. *In Chronic Bronchitis, advanced stages of Pneumonia, Congestion of the Lungs,* and the *Cough of Old Age,* the following formula is often productive of excellent effects:—℞ Ammon. Chlorid, ʒj., Ext. Glycyrrh. ʒj., Spt. Etheris Sulph. Co. fʒij., Aq. ad fʒvj. M. Dose, a tablespoonful every two or three hours. Decoction of senega may often advantageously replace water as a vehicle; and ipecacuanha or squill may be added according to circumstances.

157. *In Hepatitis and Abscess of the Liver,* Dr. W. Stewart[2] (Madras Medical Service), after considerable experience in its use, regards the chloride as almost a specific, and he pronounces it highly serviceable *in all cases of Liver Disease,* whether depending on organic changes or on functional derangement. The proper period for its exhibition is after the abatement of the acute symptoms, and when diaphoresis has been freely established, when it should be administered in doses of gr. xx. night and morning. The evidence he adduces in support of his views is very strong, though insufficient for the purpose of proving what he claims for it, viz., that it exerts a specific action in preventing and curing abscess of the liver. He also speaks highly of its efficacy in *Chronic Dysentery,* and advises its continued use for some time after the subsidence of the acute symptoms. It is a remedy well worthy of attention in *Congestion and other Chronic Affections of the Liver.* Dr. Budd[3] mentions a case of *Waxy Enlargement of the Liver,* in which a marked diminution of size and eventual cure followed the use of the chloride in doses of gr. v.–x. thrice daily.

158. *In Acute Jaundice, or Suppression of the Biliary Secretion, consequent on a powerful nervous shock or mental perturbation,* Dr. Anstie states that in several instances he has seen two or three doses of this salt (gr. xx. every four hours) produce a decided change, and a marked recommencement of biliary excretion. He regards it as the most powerful of all biliary functional restoratives. *In Hepatalgia,* he also speaks highly of its efficacy.

[1] Bull. Gén. de Thérap. April 15, 1859.
[2] Madras Journ. Med. Science, 1878, and Feb. March and Dec. 1872.
[3] Dis. of Liver, p. 335.

159. *Dropsical Affections.* The chloride has been little employed in England in these affections, but it is held in high esteem in various parts of Europe. It is stated to be particularly useful in *Dropsy dependent upon hepatic disease;* and also in *Ovarian Dropsy.* In the latter affection, where there are so few remedies of even reputed efficacy, it should meet with a fair trial. It is favourably spoken of by Dr. Copland. In passive cases, he advises its combination with warm diuretic infusions.

160. *In Fibrous Tumours of the Uterus,* Atlee, of Philadelphia,[1] has found more benefit from the chloride, gr. x. twice or thrice daily, continued for weeks and months consecutively, than from any other remedy.

161. *Hæmorrhages. In Hæmoptysis,* Dr. Copland (ii. p. 87) advises this salt, in combination with hydrochloric acid, thus :—℞ Ammon. Chlor. ʒiss., Acid. Hydrochlor. D. fʒss., Decoct. Hordei Co. Oj. M. Cap. coch. amp. iij. 2dis vel 3tis horis. It appears to be chiefly applicable to passive cases, when the vital powers are depressed. *In Hæmatemesis,* a formula similar to the above has been employed with advantage. *In Uterine Hæmorrhage,* Dr. Copland considers that it will prove serviceable, especially in cases of debility, and when the discharge is draining or remittent. It may then be given with cinchona or small doses of opium.

162. *In Senile Gangrene,* Dr. Gru[2] obtained good results by placing the affected foot in a pediluvium containing oz. vij. of the chloride. It afforded relief to the pain when opium failed, and, under the use of fomentations containing the salt, recovery ensued.

163. *In Hooping-cough,* the chloride was commended by Stoll at an early stage, with oxymel. Dr. Copland states that he has found it an excellent refrigerant, anti-spasmodic, and tonic, in several instances. It might be advantageously combined with ipecacuanha.

164. *In Myalgia,* it is a remedy of value. It is especially useful in the myalgia of the intercostals and the secti-abdominales so often met with in the overworked and underfed portion of the labouring classes in large cities, particularly in shoemakers, sempstresses, and others who work many hours a day in cramped positions which keep certain muscles of the trunk in a permanently contracted state. *Rest* is of course *the* remedy, but when this is impracticable, as it often is, Dr. Anstie (*op. cit.*), after extensive experience, declares "that nothing in the whole list of remedies comes near to this salt in efficiency." He gives it in doses of gr. x.–xx., in the belief that not even quinine in ague is a more reliable agent than the chloride in myalgia. With such testimony, it certainly deserves a fair trial in all cases. *In Chronic Rheumatism,* it is highly spoken of by Dr. Fuller in doses of gr. xv.–xx., proving serviceable in many cases when other remedies had previously failed. Its action he considers to be most marked

[1] Brit. Med. Journ. Jan. 18, 1868. [2] Ranking's Abs. xlvi. 1867, p. 136

in muscular rheumatism. When the periosteum or joints are affected, it is seldom of use.

165. Ammoniated Chloroform.

Dr. B. W. Richardson[1] recommends this inhalation in *Zymotic Pyrexia.* Alcohol 838, saturated with ammonia, is mixed with equal parts of chloroform, and inhaled from a Wolf's bottle. Its action is as a sedative, analgesic, and antipyretic.

166. Ammoniæ Citras. Citrate of Ammonia.

Med. Prop. and Action. Febrifuge and refrigerant: it is best taken in the form of effervescing draughts, as follows :—℞ Amm. Carb. gr. xx., Lemon juice ʒvj. or Acid Citr. gr. xxiv. It will frequently remain on the stomach when other medicines are rejected.

167. *Therapeutic Uses. In Gastric Irritation depending upon an atonic condition of the mucous follicles*, the citrate of ammonia, in the form of an effervescing draught, is frequently productive of marked benefit. *In the Vomiting attendant on Ulcer of the Stomach*, it has also been advised; but Dr. Brinton (p. 171) considers that the salts of ammonia, in which he includes the effervescing mixture of the citrate and tartrate, generally do more harm than good.

168. *In Diabetes*, Dr. Prout considers the citrate the best diaphoretic we can employ.

169. *In the latter stages of Inflammatory and Febrile Attacks*, the citrate, given whilst effervescing, is not only agreeable and refreshing, but acts as a refrigerant and diuretic. *In Scarlet Fever*, it is favourably spoken of by Sir T. Watson (ii. p. 822). If the pulse is feeble and without hardness, he advises it to be given with an excess of ammonia.

170. Ammonii Iodidum. Iodide of Ammonium.

Med. Prop. and Action. A valuable alterative tonic and anti-syphilitic, approximating nearly to the iodides of potassium and sodium in properties and action. The following comparative estimate of these iodides is furnished by Berkeley Hill and Cooper (p. 428). The iodides of sodium and ammonium, they remark, contain weight for weight more iodine than the iodide of potassium, and the sodium iodide is in our opinion less depressing than the potassium iodide. The ammonium iodide, on the other hand, is really stimulating through the ammonia which it contains. For these reasons these salts may be used beneficially in weakly (syphilitic) persons, or when, as in cases of epilepsy or other forms of cerebral disease, the dose has to be frequently repeated. The ammoniacal salt having no fixed alkali, cannot hasten the disintegration of the red corpuscles in the manner soda and potassa are said to do. It is probable that the change from one salt to another is beneficial to patients who have to take iodine for long periods. The therapeutic effects and doses of all three salts are very similar in other respects, but the ammonia iodide is a very unstable salt, and should be conjoined with a few grains of the carbonate to prevent its decomposition. They are best given on a full stomach after meals. Externally it is used in the form of ointment (ʒj.-ʒij. ad Ung. oz. j.)

[1] Lancet, vol. i. 1883.

which should be freshly prepared when required for use, as it decomposes by exposure to the air.

Dose:—Gr. ii.–gr. v. or more.

171. *Therapeutic Uses. In Syphilitic Affections*, it was first employed by Dr. B. W. Richardson, who reported favourably of its operation. Subsequently it was systematically tried by Dr. Gamberini,[1] who considers—1. That it is suitable for all cases in which the iodides of potassium and sodium are employed; 2. That it leads to a rapid cure; 3. That there is great tolerance of the remedy; 4. That employed in friction with olive oil (gr. iij. ad Ol. ʒj.) it causes the disappearance of *Nocturnal Syphilitic Pains;* 5. That under its internal use *Indurations consecutive to Chancre* disappear, as do also *Indurated Glands of the Groin;* 6. That *Arthralgia, Rheumatoid Affections, Periostitis, Enlarged Glands*, and *Papulo-vesicular Syphilitic Eruptions* are the forms of syphilis most readily cured by this salt; 7. The signs of intolerance are a sense of burning in the throat and heat of the stomach, but these rapidly disappear on the suspension of the medicine for a couple of days. It seems well worthy of more extended use.

172. *In Scrofula attended with Glandular Enlargement*, in *Incipient Phthisis*, and in *Chronic Rheumatism*, Dr. Richardson used the iodide with advantage. In *Enlarged Tonsils*, he found a solution of the iodide (ʒss.) in glycerine (fʒj.) very efficacious. It was applied every night by means of a large camel-hair brush.

173. Ammoniæ Liquor Fortior. Strong Solution of Ammonia; and Ammoniæ Liquor, Solution of Ammonia.

Med. Prop. and Action. The vapour, particularly of the stronger solution, is powerfully irritant to the mucous membranes of the air-passages, the nostrils, and conjunctiva. When inhaled or taken internally, largely diluted, it proves an excellent stimulant and restorative *in Syncope, in Hysteria, in the collapse of Cholera*, and in all cases where the vital powers are much depressed. It is one of the best antidotes *in poisoning by Hydrocyanic acid, Digitalis and other sedative poisons.* It possesses powerful antacid properties. When larger doses of the solutions are swallowed, they act as violent corrosive poisons. *As a vesicant and counter-irritant*, it is a valuable and efficacious application. A simple mode of applying it is as follows:—Fill the lid of a wooden pill-box with circular pieces of lint or linen till they are above the level of the rim. Pour the strong liquor on the lint so as to saturate the folds; the box is then to be instantly inverted over the affected part, and held on with firm but gentle pressure. At first it feels like a piece of ice; in a minute or less a sense of heat and tingling is experienced; then a burning heat; and in a few minutes (from two to five) a blister is raised. M. Gondret's vesicating ointment, commonly employed in France, is composed of Lard ʒj., Oil of Almonds fʒss., Liq. Ammon. Fort. fʒv. The two first are melted together with a gentle heat, then poured into a wide-mouthed bottle, and the ammonia added. It should be constantly agitated till it becomes cold. Counter-irritation thus produced is stated to be very successful in relieving the pain in *neuralgic, convulsive* and *spasmodic* diseases. It is preferable to cantharides as a vesicatory, both on account of the rapidity of its operation and its not affecting the urinary organs.

Dose of Liquor Ammoniæ (not Fortior) ♏x.–♏xxx. properly diluted. The dose of Liq. Ammon. Fort. is one-third of that amount.

[1] Journ. de Pharm. et de Chim. Nov. 1859.

174. *Apoplexy.* In asthenic cases, in which bleeding is contra-indicated, diffusible stimulants may be given with advantage. Of these, one of the best is Liq. Ammoniæ (ℳxij.–xv.) in water. The vapour may also be applied to the nostrils.

175. *Chronic Bronchitis.* The subjoined embrocation is an efficacious counter-irritant :—℞ Liq. Ammon. fʒss.–ʒfj., Ol. Amygd. fʒss., Aq. fʒij., Ol. Rosmarini fʒj. M. This formula may also be advantageously employed in *Chronic Pleuritis, Phthisis,* and other *chronic pulmonary affections.*

176. *Bites of Venomous Snakes and Insects.* Ammonia, as a remedy for snake-bites, was first introduced into France by Jussieu in 1747, although it appears that Dr. Mead had employed it in England previous to that date. It is certainly a powerful nervine stimulant in these cases, and is more efficacious than brandy or any other stimulant. It may be given internally in doses of ℳx.–xx., in water or wine, every half-hour, or oftener if the urgency of the symptoms require it. Externally, it should be rubbed into and about the bitten part. The patient should not be allowed to lie down or go to sleep; he should be kept moving about, and his fears allayed in every possible way. Prof. Halford,[1] of Australia, strongly advocates the intravenous injection of Liq. Ammoniæ in these cases, and he relates cases successfully treated by this method. He directs a mixture of strong Liq. Ammoniæ and distilled water (two parts) to be directly but gradually injected, by means of an ordinary hypodermic syringe, into the blood by puncturing any superficial vein, and repeating it as soon as the beneficial operation ceases. Of twenty cases, some of them apparently hopeless, thus treated by different Australian practitioners, recovery took place in seventeen.[2] The trials with it, however, by Sir Joseph Fayrer[3] on the bites inflicted by the poisonous snakes of India proved failures, and he further disproved the antidotal power of Liq. Ammoniæ by mixing it with the poison before injecting the latter into an animal, when it was found in no way to delay the fatal result. Ammonia, therefore, observes Dr. H. C. Wood (p. 120), cannot be regarded as a specific in snake poisoning, but as the injection can do no harm, it should be practised, yet never to the exclusion of other measures. *In Bites of Scorpions, Centipedes, Mosquitoes, and other Venomous Insects,* a liniment composed of equal parts of Liq. Ammoniæ, Ol. Olivæ, and T. Opii, well rubbed over the bitten part, affords great relief. A few drops of Liq. Ammoniæ in water may also be given internally.

177. *Pruritus Pudendi.* Dr. Dewees relates a very obstinate case of pruritus in a female, which completely yielded to injections into the vagina of fʒss.–fʒj. of the solution in Oss. of water. "It succeeded like a charm." He adds that he has since successfully employed it in numerous cases. It should be freely injected into the vagina.

178. *Tic Douloureux, Neuralgic Affections of the Face.* M. Ducros

[1] Lancet, Jan. 30, 1869.
[2] Brit. Med. Journ. August 27, 1870.
[3] Ind. Ann. of Med. Science, 1872.

and other French physicians have found that Liq. Ammoniæ, applied with a camel-hair brush to the palate and gums, so as to cause a profuse discharge of tears and saliva, rapidly cured some obstinate cases of tic douloureux. It was also found of great benefit in the same cases, if given internally; gutt. xx.–xl. in a cupful of thick gruel at bedtime. Applied externally as a counter-irritant (*ante*), it often affords relief.

179. *In Baldness, Alopecia,* Sir E. Wilson states that the following stimulating wash is the best with which he is acquainted: ℞ Ol. Amygd., Liq. Ammoniæ āā f℥j., Spt. Rosmarini, Aq. Mellis āā f℥iij. M. ft. lotio.

180. *In impending Asphyxia,* ammonia vapour, used weak at first, has in some cases proved effectual in restoring animation. *In Alcoholic Intoxication* its action is often prompt and effectual. Stillé (i. p. 291) mentions having seen a man in a state of complete and helpless drunkenness speedily restored to his senses and the use of his limbs by a few drops of Liq. Ammoniæ diluted and poured down his throat. He refers to other similar cases. Mr. R. Hamilton,[1] of Liverpool, details a case of profound and prolonged *Alcoholic Coma* which speedily revived and eventually recovered, after all other measures had failed, under the intravenous injection of ten drops of Liq. Ammoniæ into the medio-cephalic vein of the right arm. Another highly instructive case of *Sewage Poisoning,* in which the same treatment proved successful, is related by Dr. J. T. Eskridge[2] (U.S.). The patient in this case was in an apparently moribund state; and as a last resort ♏xxxv. of Liq. Ammoniæ, undiluted, were injected into one of the veins of the arm. The pulse almost immediately lessened in frequency and increased in volume; but as these stimulant effects soon began to pass away, the injection was repeated in ten minutes, and again repeated, till 140 minims had been introduced into the blood. The patient eventually recovered. Dr. Eskridge says that, in another similar case he would dilute the strong Liq. Ammoniæ with two parts of distilled water at a temperature of 110° F. The practice seems well worthy of a trial in *Chloroform Asphyxia.*

181. Ammoniæ Phosphas. Phosphate of Ammonia.

Med. Prop. and Action. This salt has been recommended as an excitant, diaphoretic, and discutient; also, *as a solvent for Uric Acid Calculus,* and as a remedy for diseases, acute and chronic, connected directly with the uric-acid diathesis. (Dunglison.)

Dose:—Gr. v.–gr. xx. thrice daily.

182. *Therapeutic Uses. Gout and Rheumatism.* Dr. Buckler, of Baltimore (U.S.), has published four cases of these diseases, in which the phosphate of ammonia, in doses of ℥j. daily, largely diluted, proved successful. The theory of its action is that it decomposes the insoluble urate of soda, which is the basis of gouty

[1] Lancet, Aug. 2, 1879. [2] London Med. Record, Feb. 15, 1883.

deposits, and converts it into phosphate of soda and urate of ammonia, both soluble salts, which may be readily eliminated by the secretions. Dr. Garrod has observed much good from its long-continued employment in chronic conditions of the gouty habit.

In Diabetes, Dr. Basham[1] employed the following formula with excellent results:—℞ Ammon. Phosp. Ammon. Carb. āā gr. x., Sp. Ammon. Arom. ♏xxx., Aq. fl. oz. j. M. This, added to the juice of a fresh lemon, to be taken thrice daily. It requires to be persevered in.

AMMONIÆ SESQUICARBONAS. See AMMONIÆ CARBONAS.

183. AMMONIÆ SPIRITUS AROMATICUS. Aromatic Spirit of Ammonia. Spirit of Sal Volatile.

Med. Prop. and Action. Stimulant. On account of its pleasant smell and taste, it is generally preferred to Liq. Ammoniæ, to which, though much weaker, it bears a close resemblance in medicinal properties.

Dose:—♏xxx.-fl. drm. j. in water.

184. *Therapeutic Uses.* Similar to those of Liq. Ammoniæ. *In Languor, Syncope, Hysteria,* and *Nervous Debility*, it proves very serviceable. *In the Flatulent Colic of Children* (gutt. ij.–v. in milk), it affords more speedy relief than any other remedy. *In Heartburn* and *Acidity of the primæ viæ*, it also proves speedily effectual.

185. AMMONIÆ SPIRITUS FŒTIDUS. Fœtid Spirit of Ammonia.

Med. Prop. and Action. A valuable stimulant and anti-spasmodic.

Dose:—♏xxx.-fl. drm. j.

186. *Therapeutic Uses. In Hysteria and the Flatulent Colic of hysterical women*, it may be given with great advantage, in doses of fl. drm. ss.–fl. drm. j. *In obstinate Flatulence in Children*, combined with Magnes. Carb. and Aq. Anethi, it will often succeed when other remedies fail.

187. AMMONIÆ VALERIANAS. Valerianate of Ammonia.

A salt introduced in 1856 by M. Déclat, of Paris, and favourably reported of by Dr. O'Connor,[2] in *Neuralgia*, and in *Nervous Affections*, as *Epilepsy, Chorea, Hysteria, &c.*; but it is very deliquescent, and hence uncertain in its operation. Every good that could be expected from it will probably be more certainly obtained from the ammoniated tincture of valerian (*q.v.*) Dose: gr. ij.–viij. or more, dissolved in water.

188. AMMONIACUM. Gum Ammoniacum.

Med. Prop. and Action. Stimulant, expectorant. In asthenic pulmonary diseases it proves very useful, by promoting expectoration, when this is deficient, and by assisting expulsion when secretion accumulates in the air-passages, and the patient has not strength to expectorate. It is best given in

[1] Brit. Med. Journ. April 10, 1869.

[2] Lancet, Jan. 18, 1862.

the form of mixture (*infra*). Externally, in the form of plaster, it acts as a stimulant.

Dose:—Of Ammoniacum gr. x.-xx., in emulsion or pill. *Of the Mixture* (Ammoniacum oz. ¼, Water fl. oz. viij., triturate and strain) fl. oz. ½–j.; *Ammoniacum and Mercury Plaster* (Ammoniacum oz. xij., Mercury oz. iij., Olive Oil fl. drm. j.; Sublimed Sulphur gr. viij.), for external application only.

189. *Therapeutic Uses. In Spasmodic Asthma*, ammoniacum often proves highly serviceable, relieving the symptoms in a remarkable manner. It is best given combined with T. Scillæ, and a small portion of hyoscyamus or conium. Plasters of ammoniacum applied to the chest afford relief. *In Hysterical Asthma* it also proves most useful. It should be combined with equal parts of assafœtida. *In the Chronic Catarrh of Old Age*, the following formula is a popular one in the United States: it is said to be very efficacious:—℞ Gum Ammon. ʒij., Acid. Nit. Dil. fʒij., Mist. Acaciæ fʒviij. Dose: fʒj.–fʒiss., in any bland fluid, every two or three hours. It is chiefly useful when much expectoration has accumulated in the air-passages.

190. *In Joint Affections consequent on Rheumatism and Rheumatic Gout* Emp. Amm. et Hydrarg. is a very useful application. It proves equally serviceable when the tendons, bursæ, or periosteum are affected.

191. Amygdalæ Amaræ. Bitter Almonds.

Amygdalæ Dulces. Sweet Almonds.

Med. Prop. and Action. Sweet almonds are demulcent and nutritive. They have no very sensible medicinal properties. They are chiefly used in making the compound powder and mixture. A bland fixed oil (Ol. Amygdalæ) is obtained from both varieties, which is gently laxative in doses of fl. oz. j.–fl. oz. ij. Both sweet and bitter almonds contain an azotized substance called *Emulsine* or *Synaptase*. Bitter almonds differ from sweet almonds in containing also another azotized substance named *Amygdaline*. By the action of a solution of emulsine on a solution of amygdaline, are obtained, among other products, hydrocyanic acid and the volatile oil of bitter almonds. Bitter almonds, from containing amygdaline and emulsine, which together produce hydrocyanic acid, are sedative and poisonous, and have proved fatal even in moderate quantities. The essential oil of bitter almonds of commerce is a mixture of volatile bitter almond oil (Hydride of Benzoyl) and hydrocyanic acid, with small quantities of benzoic acid, benzoin, and benzamide. It is highly poisonous, being in general four times as strong as officinal hydrocyanic acid. It has been occasionally used as a substitute for hydrocyanic acid in doses of mj¼ to mj., but it is an uncertain and most dangerous remedy. The smallest dose occasionally produces urticaria and other unpleasant symptoms. Bitter almond water is also very poisonous.

Dose:—Of Almond Mixture (Compound Powder of Almonds, oz. ijss., Water Oj.) fl. oz. i.–ij. *Compound Powder of Almonds, Confectio Amygdalæ*, L. Ph. (Sweet Almonds oz. viii., Powdered Refined Sugar oz. iv., Powdered Gum Acacia oz. j.), used only in preparing the mixture.

192. *Therapeutic Uses. In Eczema*, as an anti-pruritic, Sir E. Wilson[1] strongly recommends the following lotion:—Emulsion of

[1] Journ. of Cutaneous Med. Oct. 1869.

bitter almonds, 50 or 30 to aq. ℥vj., dilute hydrocyanic acid ℥ij., spirit of wine, ℥xiv. M. Sometimes borax may replace the hydrocyanic acid, and the spirit of wine be omitted; or the original lotion may be rendered stimulant by the addition of gr. j.–ij. of perchloride of mercury to each ounce. As soon as the lotion is dried, oxide of zinc ointment, or other ointment, should be applied. Emulsion of bitter almonds is a very soothing application in *Lichen Tropicus or Prickly Heat, in Urticaria and other Skin Diseases* attended by much irritation.

193. *In Lumbago, Painful Affections of the Joints, &c., connected with Chronic Rheumatism*, Dr. Fuller speaks highly of a liniment composed of essential oil of bitter almonds (℥j.) and almond oil (℥xv.). In his hands it has proved very efficacious.

194. *In Diabetes*, Dr. Pavy advocates the use of a bread made of sweet almonds. Without containing a trace of starch, it is, unlike bran bread usually in use in this disease, pleasant to the taste, and, if properly made, quite digestible.

195. Amyl Nitris. Amyl Nitrite. Nitrite of Amyl.

A very volatile fluid, at first colourless, afterwards yellowish, with a peculiar, not disagreeable smell, resembling over-ripe pears. Obtained by the action of nitric or nitrous acid on amylic alcohol. Introduced into practice by Dr. B. W. Richardson in 1864.

Med. Prop. and Action. Cardiac stimulant and anti-spasmodic. The first effects of the inhalation of this agent in healthy persons are increased frequency of the cardiac pulsations (the pulse rate in some instances being raised from a normal state of about 70 to 120 or 140 pulsations in the minute), with a feeling of palpitation and throbbing of the carotid, followed in the course of thirty to forty seconds after the commencement of the inhalation by flushing of the face, warmth of the head, face and neck, with perspiration; the latter symptoms being often general. Breathlessness and disposition to cough, giddiness, headache, slight indistinctness of vision, lassitude, and a feeling of intoxication are among the variable after-effects. The actual thermometric temperature of the body does not appear to be much if at all affected, and consciousness is always preserved (Gairdner). These effects, as pointed out by Dr. Lauder Brunton,[1] are mainly due to the action of the nitrite upon the walls of small arteries, but whether upon their muscular coats or upon their peripheral nerves remains an open question. Dr. Talfourd Jones,[2] whose paper on this agent is full of interest, considers it probable that it acts upon most, if not all, unstriped muscular fibres. Dr. Richardson's experiments tend to show that it causes paralysis of the chain of organic nerves which supplies the contractile power of the blood-vessels; thus, when applied to the olfactory filaments by inhalation the impression is conveyed along the ganglionic tract, causing more or less paralysis of the vaso-motor nerves, and inducing muscular and arterial relaxation (Jones, *loc. cit.*). It has been noticed by Peck, and confirmed by Ladendorf, that objects look yellow to a person fully under the influence of the drug. After poisonous doses the symptoms have been great pallor, dilatation of pupils, excessive muscular relaxation, slow, scarcely perceptible, pulse, and irregular respiration. (Dr. H. Wood, p. 354.) Under amyl inhalation, arterial blood becomes of almost the same colour as venous blood, but is distinguishable from it by possessing a peculiar chocolate hue, which is not lost by exposure to the air. This Dr. A. Gamgee[3] has

[1] Journ. of Anat. and Phys. vol. v.
[2] Practitioner, Oct. 1871, p. 213.
[3] Philos. Trans. 1868, p. 589.

shown to be due to the formation of nitrite-oxyhæmoglobin, and that by this means the ozonizing of the blood, and hence oxidation of the tissues, are lessened. To this action on the blood is probably due the reduction of the temperature of the body observed by Dr. Wood. The nitrite in larger doses, whether inhaled or introduced subcutaneously, produces a diabetic state of the urine which is greatly increased in quantity. One singular effect of the nitrite observed by Dr. Crichton Browne [1] remains to be noticed—viz., that when inhaled during a state of unconsciousness, it produces what may be called an attack of yawning; no such effect being observable when administered to persons in a state of consciousness. He concludes that the nitrite when inhaled during a state of unconsciousness has a specific action upon the motor centre of the mouth, and calls into action by preference the muscles of the lips and lower jaw. Whether this takes place reflexly, or through the agency of the vaso-motor apparatus, is an undetermined point.

196. *Dose:*—The nitrite may be administered by inhalation, internally by the mouth and by subcutaneous injection. 1. *By Inhalation.* This is the most common and safest form of administration. In all trials with it for the first time the commencing dose should not exceed one drop, and increased if necessary to two, or five, or even ten drops, sprinkled on a piece of lint or handkerchief, and applied to the nostrils, abundant access of air being allowed at the same time, and withdrawn as soon as fulness of the head is experienced. 2. *Internally.* Here the commencing doses should also be small: Dr. Wood says that he has given two or three drops on a lump of sugar, and Dr. Ringer has increased this from two to five minims, suspended in mucilage, every three hours, or thrice daily, without any ill effects, not even in some cases causing flushing, whilst others have flushed with each dose, but only whilst swallowing it. He directs the patient to be lying down when the medicine is taken; and as some patients, especially women, are very readily affected by it, it is well in the first instance, he says, to give it in smaller doses. 3. *By Subcutaneous Injection.* Dr. F. Barnes [2] states that he has employed the amyl-nitrite hypodermically in thirty cases, using a ten-per-cent. solution in rectified spirit, and in no case did any untoward inflammatory or suppurative symptoms occur afterwards. The action of the drug was immediate in every case, the subjective phenomena being like those experienced when using the ordinary methods of administration. The spirit solution, says Dr. Barnes, appears to be an excellent preparation for use, as a small quantity kept in an ordinary stoppered bottle for some months retained its full efficiency. The dose usually administered was ♏x. of the solution, equal to ♏j. of amyl-nitrite. *As an External Application* it is recommended by Dr. Kurz,[3] of Florence; but its ready volatility must interfere with it as an ingredient in liniments; besides which, when thus employed, the patient cannot well fail to inhale more or less of its vapour, and in this way come under its influence to a dangerous or inconvenient extent.

197. *Observations on its Use.* 1. Some persons are much more affected by the nitrite than others, one being able to inhale five or ten drops without inconvenience, while a whiff from the bottle held at a distance will affect another with great giddiness. (Ringer.) Hence the necessity for great caution in commencing its use.

2. The first or initial doses should in all cases be given under medical supervision. Subsequently, when the patient has become habituated to it, this ceases to be necessary.

3. Patients become habituated to it, so that after a while it must be inhaled or given internally several times before it affords relief. (Ringer.)

4. Great caution and judgment should be exercised in its employment in the aged or subjects of arterial degeneration. (Anstie.)

5. Anæmic people bear very much larger doses than those who are not anæmic. (Dr. G. H. Evans.)

6. The patient should be seated while inhaling, as the peculiar effects of the

[1] Practitioner, Sept. 1874.
[2] Brit. Med. Journ. June 3, 1882.
[3] Practitioner, Feb. 1882.

nitrite are produced almost instantaneously, and may alarm a very nervous or hysterical female. (Dr. Douglas Lithgow.)

7. Should any excitement or other alarming symptoms occur, cold affusion to the head, face, and chest, with a free supply of fresh air, are the proper means to use. (Ibid.)

8. The symptoms generally increase in intensity for a minute or two after the withdrawal of the drug. (Dr. H. Wood.)

9. Care should be taken to employ a pure article. Only such a preparation should be used as has no unpleasant smell, as volatilizes without residue in a few seconds, and as has a neutral or only weak acid reaction. (Binz.) By long keeping or exposure its efficacy is impaired or lost.

10. Although it may be used internally or hypodermically with safety, inhalation as a general rule is the best mode of administration.

198. *Therapeutic Uses.* *In Angina Pectoris* the use of amyl inhalation, suggested first by Dr. Richardson in 1864, has been fully established on a basis of careful clinical and experimental observation by Dr. Lauder Brunton,[1] Dr. Talfourd Jones,[2] Dr. Madden, of Torquay,[3] Dr. G. W. Balfour,[4] and others. Dr. Balfour classes it as "foremost among all our modern appliances for the relief of this dreadful breast-pang." "In all slighter attacks," he continues, "it serves to give perfect relief, and in more severe paroxysms it alleviates when it cannot completely remove the pain. It flushes the face, quickens the heart-beat, and has been experimentally found to lower the blood-pressure in animals to whom it has been administered. It was originally employed by Dr. Brunton in the treatment of angina, on the supposition that this depends upon increased intra-arterial blood-pressure, but this position has not been satisfactorily established. If we accept the face-flushing as a proof of lowering the blood-pressure, then, continues Dr. Balfour, "I am in a position to state that two specimens of nitrite of amyl will flush the face in apparently the same degree, yet only one will relieve the pain. The specimen which relieves the pain is one that has been freshly prepared, or which has been kept in a hermetically sealed capsule: the other has been kept for some time in an ordinary stoppered bottle." The conclusion which he arrives at from these facts is, that the relief to the pain in angina is obtained not from lowering of the blood-pressure, but from the action of a volatile narcotic, which gradually escapes from the amyl when kept, unless it is enclosed in hermetically sealed glass capsules. As these are now readily obtained, we possess a remedy which can be safely entrusted to the patient, and which is certain to give relief in all ordinary attacks." If it fail, as of course it occasionally does, recourse must be had to chloroform (*q.v.*). Dr. George Johnson,[5] from an exhaustive examination of the subject, concludes that the relief by the nitrite in angina pectoris is due to its anti-neuralgic power, and not directly to its relaxing influence on the muscular arterioles. Amyl inhalation not only relieves the urgency of the symptom at the time, but is thought by some to lengthen the periods between the paroxysms, which is very important. The patient, when he becomes habituated to its use, requires a far larger dose

[1] Lancet, July 27, 1867.
[2] *Op. cit.*
[3] Practitioner, 1872, p. 331.
[4] Edin. Med. Journ. March 1881, p. 769.
[5] Brit. Med. Journ. June 23, 1877.

to obtain relief than he did at first; and although it may be free from the great danger which formerly was thought to attend its use, it should not be used recklessly, or without due circumspection.

199. *In Spasmodic Asthma*, amyl inhalation has been successfully employed by Dr. Talfourd Jones (*op. cit.*) and others; and Dr. Gairdner ("Syst." iv. p. 589) states that his experience of it is certainly favourable not only in angina, but also in many cases of *Cardiac Asthma*, as well as in true spasmodic asthma without cardiac complication. It has also been found serviceable in relieving cardiac and other forms of *Dyspnœa*.

200. *Urœmic Asthma.* Dr. Solomon Smith[1] recommends it in uræmic asthma, when it is due to failing heart, associated with and consequent upon Bright's disease. He justly points out that the nitrite is only to be considered as treatment of the symptom, and must be aided by careful general treatment suited to the case.

201. *In Epilepsy*, we have the testimony of Dr. Crichton Browne, Weir Mitchell, and others, as to the value of amyl nitrite as a palliative. It is applicable to two periods or conditions in this disease—(1) the *status epilepticus*, in which fit succeeds fit in rapid succession, after brief intervals of unconsciousness; and (2) when the fit recurs at more or less lengthened periods, and when there is a notable interval between the aura and the convulsion. In the former, the patient under amyl inhalation recovers more or less consciousness; the first indication of returning consciousness in most cases being a yawn, as noticed by Dr. C. Browne (*ante*). In the latter class, a few whiffs of the nitrite, immediately on the aura being felt, will usually, if not always, prevent the threatened convulsion. An epileptic patient, under these circumstances, should carry a small phial containing a few drops of the drug, and inhale it at once whenever the aura is felt. Epileptics, according to Dr. C. Browne, are more sensitive than others to the action of amyl. Dr. Ringer employed it internally in these cases (see dose), but this mode of administration does not seem to possess any advantage over inhalation. The remedy, it should be borne in mind, is a palliative, not a curative one.

202. *Neuralgia*, especially occurring in weakly anæmic subjects is often benefited by amyl inhalation. Dr. G. H. Evans[2] details three cases of *Facial Neuralgia* which yielded to it, and in *Nervous Cephalalgia*, Dr. Douglas Lithgow[3] says that he has never known it fail to produce entire and almost immediate relief. In several instances he had to increase or repeat the dose, but as a general rule two drops placed on the palm of a patient's hand, and inhaled, were found sufficient. A case of *Hemicrania* cured by the inhalation of five drops of the nitrite is recorded by Dr. Berger,[4] of Breslau, and another of *Neuralgic Headache*, in which instantaneous relief was obtained from the inhalation of three drops, is related by Dr. J. More.[5] Dr. Kurz, of Florence (*op. cit.*), recom-

[1] Brit. Med. Journ. 1883, p. 1115.
[2] Practitioner, Sept. 1875. Lancet, Oct. 16, 1875.
[4] Practitioner, Oct. 1871.
[5] Practitioner, Nov. 1880.

mends its external application in this class of cases, and also in *Toothache*, whether nervous or arising from caries.

203. *Spasmodic Affections.* *In Spasmodic Colic* and *Enteralgia*, also in *Laryngeal Spasm*, Dr. Talfourd Jones used amyl inhalation with satisfactory results. Dr. F. Barnes (*op. cit.*) mentions a case of severe *Duodenal Colic* where the patient was found rolling on the floor from the acuteness of the pain, when, on injecting ℥xv. of the spirit solution (*ante*), the pain disappeared as if by magic, and the patient was at once able to resume his usual position. *In Tetanus*, amyl inhalation was first suggested by Dr. Richardson, but the trials with it seem to have proved failures.[1] Dr. H. Wood (p. 361) considers that the physiological action of the remedy very strongly indicates it as an antidote in *Strychnia poisoning.*

204. *In Cholera* the nitrite was advised by Dr. Lauder Brunton[2] on theoretical grounds, and it seems well worthy of a fair trial. He considers that it should be given internally, or by subcutaneous injection—not by inhalation.

205. *In Intermittent Fever*, Dr. H. Wood (p. 361) states he has seen it used in a number of cases, with the invariable result of putting an end to the cold, and of not affecting the hot stage.

206. *In Sea Sickness*, amyl nitrite, on the recommendation of Dr. Clapham[3] and others, has come much into vogue, but the advisability of the practice is called in question by Dr. C. R. Illingworth,[4] who considers that the dangers connected with its indiscriminate use to be great. He gives a case in illustration of this. Its effect at the best is very temporary.

207. *In Puerperal Convulsions*, Dr. W. F. Jenks[5] found the nitrite efficient in arresting, but dangerous on account of producing uterine relaxation and post-partum hæmorrhage; but this danger is perhaps overrated, as Dr. E. W. Kerr[6] relates a case of *post-partum Hœmorrhage* in which the inhalation of five minims has produced the best effect: the hæmorrhage ceased at once and permanently, and the patient was restored from a state of collapse. Dr. Fancourt Barnes[7] relates an interesting case of *Hour-glass Contraction of the Uterus*, in which it acted admirably; "it relaxed the irregular contraction of the uterus, and acted as a sedative without producing anæsthesia." The case serves further to illustrate a remark of Dr. Barnes (senior) in his "Obstetric Operations," that "it is the *antidote or opposite force to ergot*," controlling and suppressing the powerful contracting effect of that agent.

208. *In Dysmenorrhœa*, especially in that of chlorotic girls, the nitrite has been used with good effect by Dr. Kurz,[8] of Florence. In mild cases, he says its external application suffices, but in others it should be given by inhalation. In those cases complicated with inflammatory condition of the uterus, or its appendages, the results were doubtful or negative.

[1] Practitioner, Aug. 1877.
[2] Brit. Med. Journ. Jan. 13, 1872.
[3] Lancet, 1875, vol ii. p. 276.
[4] Lancet, Aug. 2, 1879, p. 184.
[5] Wood, *loc. cit.* p. 360.
[6] Brit. Med. Journ. Nov. 1, 1879.
[7] Brit. Med. Journ. March 18, 1882.
[8] Practitioner, Feb. 1882.

209. *In Lumbago* at the outset, amyl injections are highly spoken of by Dr. F. Barnes (*op. cit.*). A patient, he says, who is unable to bend the trunk without the most exquisite pain, can, five minutes after the injection, do so quite readily. He used the 10 per cent. solution. (See dose.)

210. In some forms of *Syncope*, especially in anæmic subjects, the inhalation of a few drops of amyl nitrite often speedily restores consciousness. A good illustrative case is recorded by Dr. W. O'Neill.[1] "It has been recommended in *Asphyxia from Drowning or Hanging, and in Asphyxia of the new-born.* But the first indication in these cases is the induction of artificial respiration, after the successful initiation of which, inhalations of the nitrite doubtless assist in overcoming the concomitant spasm of the smaller arteries. One of the most important indications for the use of the drug is *threatening Paralysis of the Heart from insufficient compensation.* In such cases it is necessary to gain time until digitalis and alcohol can unfold their action, and here nitrite of amyl stands pre-eminent." (Dr. Kurz, *op. cit.*)

211. *In Chloroform Poisoning* amyl inhalation is said to be an agent of some value. Three cases illustrative of its beneficial operation are recorded by Mr. C. Bader.[2] Under its use there was quick restoration of breathing, return of colour, and the rapid occurrence of sickness. It seems an advisable plan, as a matter of precaution, to have a small supply of the nitrite ready at hand whenever chloroform anæsthesia is to be induced. In a case of *Chloral Poisoning* related by Dr. Sinclair Coghill,[3] though it eventually terminated fatally, the inhalation of the nitrite induced rapid recovery of warmth and colour, with restoration of the respiratory function. May it not be, asks Dr. Coghill, that the nitrite of amyl may prove an appropriate antidote to chloral, when the drug has been administered in such quantity as to act on the respiratory centres *and contract the pupils?* Two cases of *Opium Poisoning*, which recovered under the use of amyl inhalation, are recorded by Dr. Turner.[4] Dr. F. Barnes (*op. cit.*) relates a case of *Paraffin Poisoning* in which the patient was in a state of collapse, and almost pulseless, in which one hypodermic injection (see dose), inhalation having been ineffectually tried, brought on immediate resumption of cardiac function, the man speedily recovering.

212. Amylene.

Med. Prop. and Action. An anæsthetic agent discovered by Balard in 1844. Amylene was introduced as an anæsthetic in 1856 by Dr. Snow,[5] with whom it continued to be a favourite anæsthetic to the period of his death, in 1858. It was considered by him to possess the following advantages over chloroform and ether:—1. The greater ease with which it could be breathed, owing to its entire want of pungency and irritating property. 2. The greater readiness with which absence of pain is obtained, with less profound coma than usually accompanies chloroform or ether. 3. The greater promptitude

[1] Practitioner, Dec. 1877.
[2] Lancet, May 8, 1875.
[3] Brit. Med. Journ, June 28, 1879.
[4] Glasgow Med. Journ. Jan. 1883.
[5] On Anæsthetics, pp. 373–419.

with which patients generally recover from its effects. 4. The greater infrequency of vomiting. 5. The less amount of rigidity and struggling during its operation; and 6. The small amount of headache which results from its use.

Other practitioners have not formed so high an estimate of the value or safety of amylene as Dr. Snow; indeed, the French Academy of Medicine (apparently on insufficient grounds) has condemned its employment as dangerous. Still, any statement coming from so experienced an observer as Dr. Snow demands every attention. His remarks will repay careful perusal. Two deaths are said to have occurred in its use.

213. Amyli Iodidum. Iodide of Starch.

Med. Prop. and Action. This preparation was first proposed by Dr. Buchanan, of Glasgow, in 1836, as the best mode of administering iodine, as by this means he considered that it might be introduced into the system in far larger quantities, and in a comparatively short period, without the occurrence of that gastric irritation and other unpleasant symptoms which occasionally attend the exhibition of iodine in its free state. The average dose is a teaspoonful, given in water-gruel thrice daily, and the dose gradually increased to a tablespoonful or more.

214. *Its Therapeutic Uses* are similar to those of iodine, which it may replace in the treatment of *Scrofula, and Scrofulous Affections* generally. Dr. M'Call Anderson[1] found it serviceable in *Lupus Erythematodes*, and speaks of it as an excellent remedy in other diseases, and notably in old-standing cases of *Syphilis*. As a local application to *Ulcerated Wounds and to Chronic Ulcers of all descriptions*, Dr. Castax,[2] an army surgeon in Algeria, states that for several years he employed the iodide with great success.

215. Amylum. Starch. Common Wheat.

Med. Prop. and Uses. 1. An antidote in poisoning by iodine. 2. A test for the presence of iodine in the secretions. 3. In the form of powder, a cooling application in *Erysipelas, Small-pox, and other external inflammations*. 4. An absorbent powder in *Excoriations*. 5. In the form of decoction or infusion, an emollient enema in dysentery, &c. *In the Diarrhœa of Typhoid Fever*, when the stools are merely frequent, Sir W. Jenner[3] states that 4 oz. of starch water thrown into the rectum night and morning will often check the frequent action. Should this not prove effectual he directs T. Opii (gutt. iij.–x.) with 1½ oz. of starch water, to be thrown into the bowel night and morning *after* the passage of the stool. If fetor be present, add charcoal (*q.v.*). 6. To thicken bandages in fractures and diseases of the joints. 7. *As a means of preventing Pitting in Small-pox*, Dr. Belcher[4] mentions having used a thick mucilage of starch as a local application with excellent effect. The entire surface of the body was first sponged with tepid water. It is applicable also to various forms of *Acute Skin Diseases*.

The mucilage (*off.*) is prepared by triturating and boiling for a few minutes Starch gr. cxx. in Water fl. oz. x. The *Glycerole of Starch* is made by triturating 1 part of starch and 8 of glycerine; the mixture being gradually heated to 240° F. and constantly stirred till a translucent jelly is formed. It is a capital substitute for lard in making ointments, and keeps long without spoiling; hence it demands the special notice of tropical practitioners. As a local

[1] Brit. Med. Journ. May 1, 1884.
[2] Gaz. des Hôpitaux, No. 26, 1858.
[3] Lancet, Nov. 15, 1880.
[4] Dublin Hosp. Gaz. April 1, 1856.

emollient remedy in *Skin Diseases*, and to prevent the *Pitting of Small-Pox*, it deserves an extensive trial (Dr. Purdon).[1] As a local application in *Eczema*, Dr. Pye-Smith[2] states that it occasionally succeeds when everything else seems to fail, but that it often proves extremely irritating.

216. Anthemidis Flores. Chamomile Flowers.

Med. Prop. and Action. Aromatic tonic, said to be slightly anodyne. A strong infusion, drunk when tepid, causes vomiting, and it is frequently employed to promote the action of other emetics; but a weak infusion taken cold is said materially to allay gastric irritability. Externally, they are used in infusion as fomentations, and occasionally as enemas. *Active principles.* 1. A Volatile Oil. 2. Bitter Extractive. The volatile oil is stimulant and antispasmodic. The flowers should not be given in decoction, as boiling dissipates the oil, and renders them inert.

Dose:—Of the Extract, gr. ij–.x. *Of the Infusion* (oz. ½ boiling water, fl. oz. x.) fl. oz. j.–ij. Cold, as a tonic and stomachic; or taken warm *ad lib.* as an emetic. *Of the Oil*, ♏ij.-v.

217. *Therapeutic Uses. In Dyspepsia, Debility, Hysteria*, and in *all cases where the tone of the digestive organs, or the system generally, is depressed*, the infusion of chamomile, in doses of fl. oz. jss. thrice daily, may be given with advantage. If the stomach is irritable, a few drops of T. Opii may be added.

218. *In Flatulence and Flatulent Colic*, the volatile oil (gutt. ij.–iij.), or a strong infusion, will often afford relief when other remedies fail.

219. Antimonium Tartaratum. Tartarated Antimony. Antimonii Potassio-Tartras; Potassio-Tartrate of Antimony. Antimonium Tartarizatum; Tartarized Antimony. Tartar Emetic.

Med. Prop. and Action.. In doses of gr. $\frac{1}{16}$-$\frac{1}{12}$ as an alterative; of gr. $\frac{1}{8}$-$\frac{1}{6}$, diaphoretic and expectorant; of $\frac{1}{4}$-$\frac{1}{2}$, nauseating and sudorific; of gr. i.-iv. (in solution) emetic. Its emetic property is much increased by the addition of ipecacuanha and by vegetable acids, and its diaphoretic, by the addition of the sulphate or nitrate of potash. In excessive doses it acts as an irritant poison, forty grains having proved fatal. When administered internally, or applied to an abraded surface, it is absorbed into the system; it has been detected in the blood, viscera, and urine; it exerts a specific action on the stomach and alimentary canal, as is shown by the fact that, when injected into the veins or the rectum, or applied to the denuded skin, it produces nausea and vomiting. It is supposed to exercise a specific action also on the lungs, and this opinion is strengthened by the fact, that the lungs of animals killed by it were found congested, of an orange, red, or violet colour, and in some cases hepatized. It exercises a marked influence on the circulatory system, rendering the pulse slower and softer, this being most noticeable simultaneously with the occurrence of nausea and moistening of the skin. Although it does not appear to reduce the temperature when administered to a man in health, yet there is little doubt, though differences of opinion have been expressed on the point, that under the continued use of small doses in febrile and inflammatory affections it does cause notable decrease in temperature. "Under its use," observes Dr. Ringer (p. 284), "carbonic acid and urea are both eliminated in the urine in greatly increased

[1] Journ. of Cutan. Med. Dec. 1870. [2] Guy's Hosp. Reports, 1881, p. 224.

quantity; but whether the antimony is to be considered a mere eliminator of these excrementitious substances, or whether it likewise increases their formation is not determined." The purging which it occasionally induces may be controlled by the addition of a few drops of T. Opii. If long continued, it occasionally produces irritation of the throat and fauces, and also an aphthous ulceration of the mouth, with a great increase of saliva. Under these circumstances it should be immediately discontinued. By cautiously increasing the dose, a degree of tolerance of the remedy may be established in the system, so that large doses may be given without producing any great sensible effect. It should be given with extreme caution to young children and infants, an ordinary dose having proved fatal when given at an early age. When tartar emetic is give in small doses, continued through a long period of time, to a healthy person, poisonous effects result. Sickness and watery purging, diaphoresis without febrile excitement, a pustular eruption on the skin or palate, or a red efflorescence on the skin, symptoms of congestion of the lungs, with great weakness and emaciation, and ultimately death, are the results. Externally applied, it acts as a counter-irritant (*infra*). For an account of the microscopical investigations of Miss N. Nunn into the action of tartar emetic on the skin, see Ringer's valuable "Handbook of Therapeutics" (1883), p. 310. In poisoning by tartar emetic, the best antidotes are decoctions or infusions containing tannin and gallic acid, as of oak-bark, galls, &c,

Dose:—Of Tartarated Antimony, gr. $\frac{1}{8}$–$\frac{1}{6}$, as a diaphoretic and expectorant; gr. $\frac{1}{4}$–$\frac{1}{2}$, as a nauseant and sudorific; gr. i.–iv., as an emetic. *Of Antimonial Wine* (Ant. Tart. gr. xl., Sherry, Oj.), ♏x-xxx., as a diaphoretic and expectorant; fl. drm. j.–ij., as a nauseant; fl. drm. iv.–viij., as an emetic; or fl. drm. ij. every ten minutes, until the desired effect is produced. As an emetic for children, ♏xxx.–lx.: in most cases, however, ipecacuanha is far preferable for the young. Each fl. oz. of the Wine contains gr. ij. of tartar emetic. *Prep. for External Use. Ointment of Tartarated Antimony* or *Tartar Emetic Ointment.* (℞ Tartarated Antimony in fine powder oz. $\frac{1}{4}$, Simple Ointment oz. j. Mix thoroughly.) Powerful counter-irritant, producing after a few applications a pustular eruption, attended with more or less inflammation. The points to be particularly observed in using this ointment are—(1) to take care that the salt is finely powdered; (2) to avoid, carefully, applying it to excoriations or wounds, as from leeches, &c.—gangrene has followed the non-observance of this point; (3) to suspend its use if the salt becomes absorbed, and produces constitutional derangement; (4) not to apply it to very young children.

220. *Therapeutic Uses. In acute Inflammatory and Febrile Diseases,* tartar emetic, from its depressing action on the vascular system, from its power of subduing morbidly increased action of the heart and arterial system, and of determining freely to the skin, constituted an important element in the antiphlogistic treatment which for a long period was deemed the most effectual mode of treating this class of diseases. At the present time, however, it is only used in cases of marked sthenic fever, and when the consequent depression of the vital powers is deemed advantageous. As a general rule, it may be said that antimony is best adapted to inflammatory and febrile affections occurring in the young and plethoric, when there is much vascular excitement, with a full, bounding, unyielding pulse, hot, dry skin, and scanty urine. Its utility is chiefly limited to the earliest stages of the attack; its influence in advanced stages is comparatively small. It appears better adapted for controlling parenchymatous inflammation—*e.g.*, *Hepatitis* and *Pneumonia*, or local and superficial inflammation—than that of serous membranes. Its efficacy often appears to be increased by combination with other

remedies, as opium, calomel, or salines, as may in each case be indicated. The usual dose is gr. $\frac{1}{4}$–$\frac{1}{2}$, every two or three hours. There is one objection to antimony in these cases which has been too much overlooked—viz., the anorexia which follows its use. Antimony, by inducing nausea and destroying the appetite, interferes with the patient's taking the requisite supply of nourishment so necessary to support and replace the waste of tissue which is constantly going on, and in this manner it operates injuriously.

221. *In Intermittent Fevers*, an antimonial emetic given at the outset of the attack, unless contra-indicated by pre-existing gastric irritability, often seems of great service. In mild uncomplicated cases, a complete cure has sometimes followed the continued use of tartar emetic in doses of gr. $\frac{1}{3}$ to $\frac{1}{6}$ every two hours; strict attention being at the same time paid to the state of the bowels. This mode of treating the intermittents of Upper India proved very successful in the hands of Dr. Moore.[1]

222. *In Pneumonia*, the treatment formerly in vogue, of administering large and repeated doses of tartar emetic, is now abandoned. In cases occurring in young robust subjects, when febrile action is strong, and in the earliest stages of the attack, small doses (gr. $\frac{1}{16}$–$\frac{1}{4}$) act beneficially; it seems to promote perspiration, and thus give great relief, and it appears further to have a beneficial influence on the mucous membrane of the respiratory tract, rendering its secretion less viscid and facilitating expectoration, but it exercises no specific influence on pneumonic inflammation, as was formerly supposed. Dr. Wilson Fox ("Syst." iii. p. 698), as the result of his personal experience, expresses his belief that tartar emetic in the treatment of acute pneumonia is a remedy which can only very rarely prove of essential utility, and certainly, to say the least, the vast majority of patients will recover as well, if not better, without its use; and it is absolutely inadmissible in the adynamic forms of the disease, and also in the pneumonia of old people and in most cases in children. A very rapid pulse, he adds, contra-indicates its use, and it is highly dangerous in most forms of the delirium accompanying the disease. *In the Pneumonia of Children*, antimony, observes Dr. Hillier (p. 31), is seldom necessary or desirable; if given at all, it should be confined to those cases in which the pulse is full and strong, the temperature very high, and the skin and mucous membranes very dry and injected; and it should only be given for a short time at an early stage of the disease. *In Broncho-Pneumonia*, when emetics are required, ipecacuanha is preferable to antimony, as causing less depression. With some slight modification, the above remarks on pneumonia apply equally to *Acute Pleuritis* and *Bronchitis;* in the earliest stages in young plethoric subjects, and where much febrile action is present, small doses of tartar emetic (gr. $\frac{1}{16}$–$\frac{1}{4}$) may prove serviceable, but the period of its utility is very limited, and perseverance in its use may prove hurtful, either by its depressing action on the vascular system, or by inducing nausea, which interferes with the due use

[1] Indian Register of Med. Science, Oct. 1848.

of nutritives, which are of so much importance in these cases. In the advanced stages and chronic forms of these affections, as well as in *Phthisis*, *Asthma*, *Laryngitis*, counter-irritation by tartar emetic ointment to the chest is occasionally useful, but as a general rule it is inferior in efficacy to T. Iodi or Ung. Potass. Iod.

223. *In Croup*, the induction of vomiting in the early stage is often the most effective means of arrest, and one that may be resorted to in all stages but the last. (Dr. Squire, i. p. 261.) The choice of the emetic, however, is very important. Those which exercise a depressing influence on the system should be rigorously avoided: of these, tartar emetic seems the most dangerous, ipecacuanha somewhat less so, whilst the sulphate of zinc or copper are the safest. Dr. Morell Mackenzie (p. 180), after condemning the use of tartar emetic, observes:—"If the administration of these agents (emetics) is not quickly followed by vomiting, and the expulsion of the membrane, it is useless to repeat them; and even when the breathing has once been temporarily relieved by their use, it is very questionable if they should be again employed. In no case should the physician place too much reliance upon them." These remarks apply with some little modification to *Diphtheria*. "It is true," observes Sir J. Rose Cormack, "that emetics in diphtheria are seldom of much use, but still there are many cases in which it is right to try to effect dislodgment of the false membrane. The emetics which ought to be selected for this purpose are those which do not depress, and which act quickly. Perhaps sulphate of zinc is the most and tartar emetic the least suitable. The latter is not only unsuitable, but it is pretty certain to prove dangerous by its depressing action." Trousseau describes tartar emetic as the most dangerous of all emetics in diphtheria, adding, "it causes extreme prostration, and accelerates death."

224. *In Acute Idiopathic Mania*, Prof. Van der Kolk (p. 103, *seq.*) places great reliance on tartar emetic, given in such a manner as to produce its depressing effect on the brain and vascular system without its concomitant vomiting and purging, the occurrence of either of which effects he looks upon as interfering with its beneficial operation on the disease. To this end he exhibits it in substance with sugar in the form of powder, or in pill (never in solution) commencing with gr. $\frac{1}{4}$ or gr. $\frac{1}{3}$ several times in a day, and gradually increasing the dose, giving it on a full stomach after a meal, and with a bit of biscuit before going to bed. If the patient improves under this treatment, then his tolerance of tartar emetic diminishes, and he can no longer bear without vomiting the large doses which he took every day during the earlier excitement, and apparently without especial effect. Accordingly, the rule is as follows:—At the commencement of the disease increase the dose every second day, or even daily, until an indication of nausea occurs, and then keep at the same dose. If in the further course the patient becomes more calm, if lucid intervals occur, which are usually interrupted by repeated accessions of greater vivacity, although the disease gradually diminishes, the dose of tartar emetic must be lessened

in the same proportion as the patient becomes more sensitive to the remedy. If the bowels are sluggish, a laxative may be necessary, but if a purgative of any kind be added to the tartar emetic, the patient does not tolerate it in nearly so large doses as if taken unmixed. When much vascular excitement is present, it may be given combined with nitre, but even this after a short time has frequently to be discontinued, from its causing gastric irritation, *In Chronic Mania*, where violent irritation of the brain occurs, tartar emetic, according to Van der Kolk, still holds the first place in our list of remedies. Here it may often be advantageously combined with aloes (*q.v.*). *In Puerperal Mania*, he also advises it in frequently repeated doses; and Dr. Churchill (p. 488) observes that when the pulse is quick and the face flushed, its use may supersede the necessity of blood-letting.

225. *In Delirium Tremens*, German physicians place much reliance on tartar emetic; and it has found an advocate in Dr. Peddie,[1] who relates several cases successfully treated with it. Still, as a general rule, the practice seems of very doubtful propriety, but if adopted it should be given in the manner advised by Professor Van der Kolk in acute idiopathic mania (see Reynolds, ii. p. 92). There can, however, be little doubt of its value as an adjunct to opium in this affection, often inducing tranquillity and sleep when opium alone has failed to produce these effects.

226. *In Puerperal Convulsions*, tartar emetic in doses sufficient to induce nausea without vomiting, has the commendation of Drs. Collins, Murphy, Kennedy, and others, but it is applicable only to convulsions of a truly sthenic character occurring in plethoric subjects.

227. *In Epilepsy depending on Plethora*, Dr. Cheyne speaks highly of the influence of antimony. Dr. Bell,[2] regarding the proximate cause of epilepsy to be congestion of some portion of the nervous centres, advocates the use of tartar emetic. He relates some cases successfully treated by it in doses of gr. $\frac{1}{4}$–$\frac{1}{8}$ every four hours; but as other remedies were simultaneously employed, the force of his statements is weakened. He regards its use as not confined to sthenic cases only, but extends them to those characterized by asthenia. The value of this agent in epilepsy has been confirmed by MM. Bouley, Gillette, and Bonfils.[3]

228. *In Acute Rheumatism*, tartar emetic in large and repeated doses has been advocated by Laennec, Bricheteau, and others, but experience has shown that, however valuable it is in moderating local action, it is insufficient of itself to effect a safe and speedy cure of the disease. *In Hydrarthrosis*, it was extolled by Gimelle and others, but it has fallen into disuse as an internal remedy; it is, however, occasionally used locally as a counter-irritant in this affection and in *Chronic Synovitis*; but it is, on the whole, inferior to iodine and its preparations.

229. *In External or Superficial Inflammations*, tartar emetic often

[1] Edin. Monthly Journ. June 1854.
[2] Glasgow Med. Journ. Oct. 1857.
[3] See Ranking's Abstract, 1858, vol. xxviii. p. 86.

exercises a marked influence. *In Erysipelas*, its use was introduced by Desault, who administered it in one-grain doses largely diluted. The efficacy of this treatment has been attested by Dr. Walsh,[1] who considers that it exercises a specific influence on erysipelatous inflammation, and that it is equally applicable to all forms of the disease. Given early in *Inflammation of the Mammæ after delivery*, in small and often repeated doses, it frequently acts most beneficially. Two illustrative cases are given by Dr. J. Spender,[2] in which gutt. xv. Vin. Ant. (gr. $\frac{1}{16}$) repeated every hour, in one case for 12, and in the other for 14 hours, entirely removed the inflammatory action without the production of the slightest nausea or vomiting. He also mentions a case of *Whitlow* successfully treated in the same way. *In Bubo*, according to Mr. Milton,[3] tartar emetic in one-grain doses every second hour has a marked effect in reducing the inflammatory symptoms, so much so as to supersede in the majority of cases the necessity for surgical interference. If, in spite of the remedy, pus forms in any of the above cases, no good, but probably harm, would result from persisting in its use. *In Acute Orchitis*, small doses of antimony may be advantageously given until the pulse becomes soft and the skin moist (Hill and Cooper, p. 554). Leeches, or puncture of the scrotal skin, after hot fomentations, often affords manifest relief.

230. *To Nævus*, Mr. H. Bateman [4] states that for fifteen years he has successfully applied a plaster composed of tartar emetic (1 part) and melted Emp. Resinæ (2 parts), spread on thin leather or linen. It should entirely cover the nævus, but need not extend beyond it; should it become detached before it has produced sufficient inflammation and pustulation, it should be renewed immediately; if there be too much inflammation, poultices and fomentations may be applied. Should the skin be unusually insusceptible or the nævus unusually thick, equal parts of tartar emetic and emplastrum resinæ may be used. Its employment should be continued till the nævus sloughs. A somewhat similar treatment is advocated by Dr. Zeissl.[5] Mr. T. Smith [6] regards it as inferior to perchloride of iron or nitric acid (*q.v.*).

231. *In obstinate Constipation dependent upon the absence of mucus to lubricate the intestines*, tartar emetic sometimes produces relief. Dr. Nevins (p. 353) mentions, in illustration, the case of an old man who had no evacuation from the bowels for eleven days, notwithstanding the employment of purgatives of every description, and of glysters, great and small. He administered the salt in doses of gr. $\frac{1}{4}$ every hour, with one drachm of sulphate of magnesia. He was constantly nauseated by it, and in six hours passed a mass of hardened fæces; after which he had no further ailment.

232. *In Purulent Ophthalmia and other inflammatory Affections of the Eye*, tartar emetic constituted a conspicuous part in the anti-

[1] Dublin Quart. Journ. Aug. 1850.
[2] Brit. Med. Journ. March 23, 1867; and Med.-Chir. Rev. Jan. 1872.
[3] Med. Times, Oct. 4, 1851.
[4] Lancet, Nov. 6, 1869.
[5] Med. Times, Oct. 2, 1862.
[6] Lancet, Aug. 17, 1867.

phlogistic treatment formerly employed; but recent experience has shown the superiority of the tonic system, and has led to its abandonment (see Argenti Nitras). Dr. Ringer (p. 287) states that it may be given with advantage (gr. $\frac{1}{36}$–$\frac{1}{48}$ three or four times daily), in *Strumous Ophthalmia. In Chronic Ophthalmia and Opacities of the Cornea,* a solution (gr. j. Aq. fl. drm. ij.) has occasionally been used as a stimulant collyrium.

233. *In Sub-acute Ovaritis,* Dr. Rigby speaks highly of counter-irritation by tartar emetic ointment over the seat of disease. When the eruption appears, he directs it to be dressed with lint until a slight degree of sloughing is produced. He states that he knows no application so efficacious. At the same time that counter-irritation is thus kept up, Dr. Graily Hewitt (p. 583) advises the following pill night and morning:—℞ Opii gr. $\frac{1}{2}$, Ext. Cannabis Ind., Camphoræ, āā gr. j. M. ft. pil.

234. *In Tedious Labours depending upon rigidity of the os uteri,* tartar emetic in days gone by was extensively used, and is to a certain extent now, but by no means with invariable success. When successful, the result was and is attributed to the depressing effects of constant nausea; just in the same way, before the days of chloroform, it was administered to muscular subjects to facilitate the reduction of dislocations by depressing the system and consequently muscular relaxation. It may, however, act beneficially as an emetic, by ridding the stomach of acrid secretions; but it could not act beneficially if the rigidity was not the result of spasm, but of a hard, firm, rigid, unyielding structure. Nevertheless, we ought to hesitate before producing debility and exhaustion in a parturient woman. (Dr. Wiglesworth.[1])

235. *In Uterine Hœmorrhage* in robust subjects, tartar emetic sometimes proves useful. In the first and second stages of flooding, Dr. Tilt states that he has seen nauseating doses of it gradually arrest the discharge. It is inadmissible in weak, debilitated subjects.

236. Pulvis Antimonialis. Antimonial Powder.

Med. Prop. and Action. Nauseant and diaphoretic in *febrile conditions,* alterative in *chronic diseases of the skin.* The action of oxide of antimony is the same as that of tartar emetic, except that its effects are modified by its inferior solubility. Slowly acted on by the fluids of the stomach, the oxide is believed to be less irritating, less sudden, and more lasting in its effects than the tartrate (Garrod). *The Pulvis Antimonialis* (Ph. B.) is intended to supersede the secret remedy known as *Pulvis Jacobi Verus, James's Powder,* and the *Compound Antimonial Powder* of the Pharm. Lond. Large quantities of both these powders have been given without producing sensible effects. Dr. Elliotson found 120 grains of the latter nearly inert. On the other hand, in five-grain doses James's powder has produced copious vomiting and purging. The mode of preparation of the *Pulvis Antimonialis* (Ph. B.) precludes any possibility of variation in the proportion of the soluble oxide. The oxide of antimony is well adapted for administration in powder or pill. In the *Pulvis Antimonialis,* the phosphate of lime is insoluble and probably inert.

Dose:—Oxide of antimony, gr. j.-iv.; Pulvis Antimonialis, gr. iij.-x.

[1] Obst. Journ. Sept. 1877.

237. Antimonium Sulphuratum. Sulphurated Antimony.

Med. Prop. and Action. Alterative; emetic. It is very uncertain in its operation; its chief value is as an ingredient in Pil. Hydrargyri Subchloridi (*q.v.*). Under its use all the constituents of the urine, especially the urea and sulphuric acid, are increased (Dr. Parkes).

Dose:—Alterative, gr. j.–v.; emetic, gr. x.–xx.

238. Antipyrin. Dimethyl Oxychinizin.

Med. Prop. and Action. Antipyrin is a quinoline compound, which seems first to have been fully investigated by Filehne.[1] Dr. Knoor, of Erlangen, discovered it. Antipyrin occurs as a white crystalline powder; it is soluble in water, and almost tasteless. It acts as an antipyretic. Three doses of from 25 to 30 grs. every hour will bring temperature to normal in three to four hours, usually accomplishing this result without the induction of sweating. The temperature may remain down for from eight to twenty hours. The pulse usually slows when the temperature falls. The fall may be as much as 5° F.[2] Both Filehne and Guttmann state that no unpleasant effects, with the exception of occasional nausea or vomiting, follow its use, even in full doses. However, according to Ranke, vomiting does pretty frequently occur, and he suggests that the drug should be given *sub cute*, thus obviating the distressing symptoms. Ranke dissolves antipyrin in half its bulk of hot water, and injects up to gr. 15 according to the tolerance of the patient. May (Deutsch. Med. Woch. 1884, Nos. 24 and 26) records a case in which collapse followed its use; he is, however, careful to say that he is not certain that the collapse was the result of the antipyrin. Another observer found an eruption, resembling measles, followed the use of 180 gr. of antipyrin. A similar eruption is reported as following its use in a case of typhus; in this instance the typhus rash was followed by hæmorrhagic extravasations, and these gave place to the antipyrin rash. Similar rashes are recorded by other observers: they occurred in phthisis, pleurisy, &c.

Antipyrin is detected in the urine within three or four hours, iodurettted iodide of potassium being the test employed (Maragliano).

The physiological action has been studied by Demme; his conclusion is that antipyrin kills by paralysing the heart; it stimulates the nervous system, in frogs and rabbits affecting the brain, the medulla, and also the spinal cord. Upon the arteries it acts through stimulation of the vaso-motor centre, causing a rise of arterial tension. In smaller doses he believes that the nervous system suffers most, and finds convulsions ensue upon its prolonged use. The mode of its action, he thinks, is to be explained upon the assumption that antipyrin is a protoplasmic poison. Demme found that caffeine acted as a physiological antagonist to antipyrin.

239. *Therapeutic Uses. Febrile Diseases in general.* Antipyrin can be employed for all pyrexial conditions. At present, statistics are wanting to show if it possesses properties rendering it of more service in any particular class of cases. Falkenheim finds it useless in *Intermittent Fever;* Alexander, employing it in *Acute Rheumatism,* found it lowered the temperature, although it seemed to exercise no specific control over the disease; Guttmann has employed it with success in *Scarlatina*, *Typhus*, and *Phthisis;* May finds antipyrin decidedly more serviceable in pneumonia than is quinine.

240. *Diseases of Children.* Penzoldt has used it in the febrile con-

[1] Centralblatt f. die Med. Wissensch. 1884, No. 29; and L. Med. Rec. Oct. 1884.

[2] Guttmann, Berl. Med. Woch. No. 20.

ditions of children, and speaks favourably of its use.[1] They take it well, and it seldom nauseates them. He has, in the case of delicate children, employed rectal injections, and extols their use. As to dose, he directs that gr. ij. should be given for each year of the child's age, and adds that as children soon grow tolerant of this drug, the dose has to be increased from time to time. Demme has found antipyrin most serviceable for pyrexia in children; he believes it superior to the other antipyretics. He cautions against its use when the heart's action is weak. He, with many other observers, finds even infants bear it very well. He prefers hourly doses of four grains or less, and decreases this quantity.

241. *Erysipelas.* While Van Noorden finds antipyrin's good effects less marked in erysipelas, Ernst and others assert it is peculiarly efficacious.

242. *Hectic Fever.* Many observers find that hectic is controlled by a midday dose of this remedy, which obviates the evening rise.

243. *Phthisis.* Antipyrin will, it is said, lower the temperature without producing excessive sweating, or hæmoptysis. Agaricine or atropia, given in ·005 gr., checks whatever tendency there is to the production of sweating, and in no way impairs the use of the drug.

244. *Typhus.* While Guttmann extols its use, others (Penzoltz, Bielschowsky) believe it less serviceable, and in many cases attribute the collapse which occurred as due to its action. In these cases, rigor occurred on the consecutive ascension of pyrexia. According to Van Noorden, it possesses peculiar power in lessening cerebral symptoms in typhus.

245. Apiol. Apiolum. The peculiar principle of the seeds of Common Parsley.

Med. Prop. and Action. Tonic, anti-periodic, and emmenagogue. Joret and Homolle[2] found that, when taken in doses of gutt. vij.–xv., it occasioned slight cerebral excitement, similar to that produced by coffee, together with epigastric warmth. In doses of fʒss.–fʒj. it caused vertigo, tinnitus, aurium, headache, &c., similar to the effects produced by a strong dose of quinine. Occasionally, its use was followed by nausea, colic, and bilious diarrhœa.

Dose:—Gutt. viij.–xv. in syrup.

246. *Therapeutic Uses. In Intermittent Fevers*, the value of apiol has been examined by Joret and Homolle (*op. cit.*). Of forty-three cases of all types, collected from various parts of France, thirty-seven were cured, and in the remaining six the fever was modified but not removed. Of thirty cases occurring in hot climates, only sixteen were cured. From these facts it is concluded that, if apiol be not of equal value to quinine in the intermittents of hot climates, it may yet be very well substituted for it in indigenous—*i.e.*, European—intermittents: other facts in favour of this remedy are adduced by M. Joret.[3] Dr. Jacquot,[4] however, subjected it to a trial in the military hospitals at Rome, and expresses great doubt as to

[1] Berl. Klin. Woch. July 1884.
[2] L'Union Med. Jan. 1885.
[3] L'Union Med. Jan. 1856.
[4] Archiv. Gén. de Méd. June 1854, p. 678.

its efficacy, only one case in six completely yielding to the remedy. It apparently deserves to be classed amongst those minor remedies which often prove successful in mild cases of intermittents. The usual dose is gutt. xv. gradually increased. In *Intermittent Neuralgia* and in the *Night Sweats of Phthisis*, Joret and Homolle consider that this remedy is likely to prove serviceable. Dr. H. Wood (p. 551) states that he employed apiol very successfully in two cases of *Malarial Disease*, in which from idiosyncracies quinine was inadmissible.

247. *In Amenorrhœa and Dysmenorrhœa* apiol, according to Dr. Thomas Sanctuary,[1] is very serviceable in functional amenorrhœa. He prefers to administer the drug in capsules immediately before the menstrual period should recur. He thinks apiol is less valuable than permanganate of potassium (*q.v.*). Dr. Joret[2] asserts that apiol is one of the safest and best emmenagogues which can be employed, not being contra-indicated even in cases of incipient pregnancy. It is thought to be especially adapted for these states when they arise from a diminution or excess or perversion of the vitality of the uterus, attended with local or general nervous symptoms. To be effectual, it requires to be administered at those periods when the menstrual discharge would be naturally expected to return, and to be continued for five or six successive days. A dose should be taken night and morning. Dr. Tilt (p. 95) found apiol act like a charm in some cases of nervous dysmenorrhœa, but of little use in dysmenorrhœa depending upon disease of the uterus; and Dr. Priestley (v. p. 740) states that in dysmenorrhœa he has often seen it give notable relief; but, he adds, whether it possesses any other property than that of a warm diffusible stimulant is not well determined.

248. Apomorphia, a base contained in opium, obtained by subjecting morphia to the action of hydrochloric acid at a high temperature. It occurs in the form of a snow-white powder, permanent when dry, but when moist soon becomes green; soluble in cold, and to a greater extent in warm water. The aqueous solution is colourless at first, rapidly changing to a dark olive green, and at the end of a few weeks almost black.

Med. Prop. and Action. Powerful emetic, introduced to notice by Dr. S. J. Gee,[3] in 1869. In doses of gr. $\frac{1}{4}$ by mouth, or gr. $\frac{1}{13}$–$\frac{1}{7}$ injected subcutaneously, it produces free emesis in about five minutes, leaving no subsequent ill effects (Riegel and Boehm).[4] The physiological action of apomorphia on the pulse, observes Dr. Walter G. Smith,[5] agrees with that observed under the production of nausea and vomiting by other means—viz., acceleration before emesis takes place, and subsequently a slight depression, with speedy return to the normal. The respiration becomes quickened and irregular previously to vomiting, and the temperature is not sensibly affected in man. There is complete freedom from gastro-intestinal irritation of any kind, and neither colic, tenesmus, nor abundant stools were observed. In many cases the act of vomiting is succeeded by an irrepressible desire to sleep. No local irritation

[1] Lancet, Jan. 10, 1885.
[2] Bull. Gén. de Thérap. Aug. 15, 1860.
[3] St. Barth. Hosp. Reps. v. p. 215.
[4] Glasgow Med. Journ. May 1872, p. 362.
[5] Dublin Journ. Med. Sci. March 1875.

was found to follow its hypodermic injection in man or animals. Dr. Smith claims for apomorphia that it is a rapid, simple, and harmless emetic, whilst the facility with which it can be administered by hypodermic injection fulfils a therapeutic desideratum adapted for special circumstances—*e.g.*, the medication of children and the insane. Similar testimony to the value of apomorphia is borne by Dr. F. M. Pierce,[1] who considers that, as to the smallness of the dose required, the certainty, rapidity, and completeness of its action, it contrasts most favourably with the old-fashioned emetics, the only drawback being its comparative costliness. Neither Dr. Smith nor Dr. Pierce makes any mention of the untoward contra-stimulant effect noticed by Dr. Gee, which he regards as the great drawback to its use; not that this occurs in all cases—far from it, but sometimes it does occur to such an extent as to cause anxiety; the patient seeming as if his muscular power were gone; the vascular power does not appear to suffer depression to an equal extent. From some observations collected by Dr. H. Wood (p. 449) it is evident that caution is requisite in the employment of apomorphia, especially in debilitated subjects and young children; it being liable in these to produce collapse. The best form for use is a freshly prepared solution in distilled water (1 part to 100). If the proportion of salt be greater, the solution becomes muddy, and it is necessary to add one or two drops of hydrochloric acid in order to clear it—a serious objection to a liquid intended for subcutaneous injection (Smith). "If only the certainty, rapidity, and absolute safety of apomorphia were known, it would undoubtedly form part of every practitioner's paraphernalia" (Dr. A. Routh).[2]

249. *Therapeutic Uses. In Pneumonia, Diphtheria, Scarlatina, &c.*, Dr. Pierce (*op. cit.*) employed apomorphia hypodermically with benefit. He employed a solution (gr. j. ad Aq. Dest. ℥. cc.) in doses of ℥ v. (gr. $\frac{1}{40}$) for children, to whom he frequently prescribed it. In one case only (a case of *Chorea*, in which it acted favourably) was it found to produce drowsiness.

250. *In Chronic Bronchitis*, Dr. Wertner, of Vienna, speaks favourably of it given internally, thus, ℞ Apormorphiæ gr. $\frac{1}{3}$–$\frac{2}{3}$, Aq. Dest. ℥xij.; dose, a tablespoonful every two hours for an adult. This is said to be an excellent cough sedative, especially useful in *Bronchial Catarrh* in the exudation stage.[3] *In Asthma*, where there is obstruction of the air-passages by plugs of mucus, especially if the block exist in the peripheral portions of the lungs, emetics are indicated, and here Dr. Berkart[4] states that he has frequently used subcutaneous injections of apormorphia (gr. $\frac{1}{12}$–$\frac{1}{10}$), and found them best answer the purpose.

251. *In Poisoning and Drunkenness*, Dr. Pierce employed apormorphia emesis for the purpose of unloading the stomach. Two cases of *Poisoning*, one *by oxalic acid* and the other *by alcohol*, are related by Dr. A. Routh (*op. cit.*), in which the powers of this drug were strikingly manifested: in one case emesis followed the subcutaneous injection of ℥v. of a solution (1 to 50) in $2\frac{1}{2}$ minutes, and in the other $3\frac{1}{2}$ minutes. It is stated that it fails to cause emesis during chloroform narcosis.

252. A case of *Protracted Labour depending upon rigidity of the os uteri*, in which apormorphia, in gr. $\frac{1}{4}$ dose, acted speedily as a

[1] Brit. Med. Journ. Feb. 26, 1870.
[2] Lancet, Dec. 23, 1882.
[3] Dobell's Reports, 1876.
[4] Brit. Med. Journ. July 17, 1880.

relaxant, is recorded by Dr. Milne.[1] He suggests its use hypodermically.

253. Aqua, Water. Aqua Destillata. Under the above heading it is proposed to furnish a *résumé* of the therapeutic usages, firstly, of common water, and, secondly, of water under its altered physical conditions of heat and cold (ice), including the use of baths; and thirdly, of mineral waters, spas, &c.

Med. Prop. and Uses. Water is readily absorbed; it is eliminated rapidly by all the emunctories. It enters so largely into the structure of the body that it is matter of no surprise that its daily exchange is so great. This daily exchange subserves various purposes. It is a ready means of introducing nutritive material, and of discharging deleterious substances; it assists in regulating temperature, and it is needful in the physical processes of digestion and assimilation.

Water, in its passage into and out of the body, plays an important part in regulating the temperature, and its effect varies in great measure with the temperature of the water ingested and eliminated.

In moderation, water promotes tissue change, and in some subjects produces obesity. (Bartholow.) Water increases the activity of the kidneys, and increases not only the urinary water, but the excretion of urea, sodium chloride, and phosphates.

254. *Therapeutic Usages.* Water is employed, firstly, simply as a vehicle, and secondly as a therapeutic agent.

Whether medicines be diluted or no is an important question. In administering natural aperient waters (*q.v.*) by largely diluting them with warm water, their action is greatly increased. On the other hand, Dr. Matthew Hay, in a research communicated to the International Medical Congress of 1881, showed that concentration of saline cathartics produced the most vigorous action, far outstripping that attained by ordinary methods of their administration.

255. Water as a beverage in disease cannot be advised unless laid under strict control. It is a poor thirst quencher, since it fails to excite salivary or gastric secretion, and hence it is usually ingested in very excessive quantities. Iced water as a drink, by exciting spasm of the blood-vessels, is harmful. Dr. Dyce Duckworth draws attention to what he deems to be a fact that water-drinkers usually drink to excess, and by unduly diluting the digestive juices provoke dyspepsia.

256. Hot water drinking in various forms of *Dyspepsia* is a very old practice. Cadet de Vaux, as far back as 1825, ordered ℥viij. of hot water (120° to 140° F.) every quarter of an hour for twelve hours, for gouty patients. Recently Dr. Cutter,[2] of NewYork, claims for a countryman of his own the introduction of hot water drinking as a cure for dyspepsia. Dr. Salisbury's directions were: The water to be at a temperature between 110° and 150° F.; the quantity taken to be Oj. or Oss. at each drinking, and determined by urinometric

[1] Edin. Med. Journ. Jan. 1870. [2] Lancet, Sept. 15, 1883.

examination. More water to be taken until the Sp. Gr. of the *urina sanguinis* reached 1015 to 1020. The drinkings were to be one to two hours before each meal, and half an hour before bed. The water was to be sipped, and 15 to 30 minutes were to be allotted to each drinking. The draughts at meals were to be limited to ʒviij.

257. *In Kidney Diseases* the great diuretic powers of water, and particularly distilled water, has led to its use in kidney diseases. It is said to have a marked effect upon *Renal Calculi*, removing them, and deterring from similar formations.

258. *In Habitual Constipation* a glass of cold water, taken upon first rising in the morning, will often regulate the bowels, and remove the unpleasant taste experienced in the morning by dyspeptics with sluggish bowels.

259. *External Uses.* As a hæmostatic, cold water (iced water) is useful in *Epistaxis and other Hæmorrhages.* On the other hand, water as hot as 110° (Lombe Atthill), 122° (Ricord), will check *Uterine Hæmorrhage*, whether post-partum or menorrhagic. During operations, the application of sponges wrung out in boiling water will stay parenchymatous hæmorrhage effectually. Ice is useful in staying sickness; hot water, when sipped very hot, is said to achieve the same end. Ice alleviates the distressing thirst of fever and diabetic patients, and is more effectual when they will suck it. Ice, placed in the uterus, has been held to promote contraction and stay hæmorrhage. When introduced into the rectum, it will not infrequently allow a patient suffering from *Retention of Urine* to pass his water.

260. The ice poultice is of use in *Hernial Protrusion:* it is necessary to make very sure that no strangulation of the gut or omentum exists, otherwise the cold application will favour sphacelation, and so increase the mischief.

261. The ice poultice or ice-cap, or running of iced water through tubes which can be adapted to the part needing treatment, will afford relief in many inflammatory states. Thus the pain of *Orchitis, Tonsillitis, Meningitis,* &c., with the *Cephalalgia of Fevers*, will be assuaged by this means. It often happens, however, that cold applications failing, the use of fomentations as hot as can be borne will give instant relief.

262. Hypodermic injections of water (Stillé and Maisch) will sometimes relieve *Neuralgia.* The spinal ice-bag has been strongly recommended by Dr. Chapman as a means of rapidly affecting the temperature of the body. The common employing of hot water in bottles or skins is too familiar as a means of counteracting shock to need more than mention. In injuries to the thorax and its contained viscera—*e.g.*, lacerated lung—it is well to avoid placing the hot-water bottles by the patient's side.

263. Affusion. Baths. Sea-bathing. Packing, &c.

264. In Cold Affusion we possess a therapeutic agent of great power, and one which requires the most skilful and judicious management.

265. *In Delirium Tremens.* Dr. Broadbent[1] has recently drawn attention to the value of the douche in this disease. It calms the patient and induces sleep.

266. In *Puerperal Mania*, marked abatement of the frenzied paroxysms will follow cold affusion.

267. *Prolonged Sleeplessness*, bordering upon delirium, also may be thus combated.

268. *In Syncopal attacks*, in *Poisoning from Chloroform, Opium, or Alcohol*, cold affusion should always be had resort to.

269. *Laryngismus Stridulus.* Dr. Ringer says: "The surest and speediest way of arresting an attack of crowing breathing is to dash cold water over the child." The water should be first dashed in the child's face, and if this fail, it should be thrown over the whole of the body.

270. Cold affusion is a valuable aid in effecting *resuscitation of new-born infants.*

271. *Leucorrhœal Discharges* are often amenable to daily injections of cold water.

272. *Hæmorrhoids.* Cold affusion acts at least as a palliative, and should be employed after every stool.

273. *In the Coldness of Feet of Women*, which, by destroying the sleep, causes depreciation of health, Dr. Ringer recommends cold water bathing of the feet, and subsequent friction with a chain towel.

274. Cold affusion from a height materially helps to strengthen the weakening which happens to *joints after long disuse* subsequent to splinting for fractures, dislocations, &c.

275. In cases in which cold affusion cannot be borne, cold sponging with water, or vinegar and water, will refresh fever patients and promote their recovery. Dr. Murchison commended the addition of small quantities of Condy's fluid or of hydrochloric acid (℥j. to ℥xx.).

276. Cold Pack. Water Bed. Cold Bath.

These methods are all available for the treatment of *Pyrexia.*

In prostrate conditions, the first two are preferable, as plunging a fever patient into the bath will produce more or less shock.

A continuous stream of water, run through a bed provided with ingress and egress tubes, readily and effectually lowers temperature. The temperature can be accurately adjusted by adding ice to the supply cistern.

This can further be supplemented by wrapping the arms in towels wrung out in cold water, and by placing them across the abdomen, covering with cotton wool and oil-silk. These towels need frequent changing. This line of treatment may be pursued with advantage in all pyrexial conditions.

277. Baths.

It would be beyond the limits of this work to consider at length the effects of various baths on the animal economy, in health as well as in disease; in the present article, therefore, a few important particulars as to their employment as therapeutic agents will be considered.

[1] Paper read before Med. Soc. of Lond. March 5, 1883.

Baths are divided into :—

1. The Cold Bath,	from	33°	to	60° F.
2. The Cool Bath,	„	60°	„	75°
3. The Temperate Bath,	„	75°	„	85°
4. The Tepid Bath,	„	85°	„	92°
5. The Warm Bath,	„	92°	„	98°
6. The Hot Bath,	„	98°	„	112°

278. The Cold Bath is employed chiefly with a view of producing one of the three following effects :—(1) A shock on the nervous system, independently of the accompanying refrigeration or subsequent reaction; (2) refrigeration, independently of the nervous shock, or vascular reaction; (3) reaction, independently of the shock or refrigeration.

Observations on its Use. 1. The morning is the most proper period for the cold bath. 2. It should not be taken whilst the body is in a state of profuse perspiration. 3. It is objectionable immediately after a full meal. 4. The head should, if possible, be immersed first. The advantage of the plunge bath is that this object is effected suddenly and with certainty. 5. It should never be continued so long as to cause shivering, blueness of the nails, &c.; five or ten minutes is a sufficient time for one bath. 6. If it produce these effects, the bath should not be repeated at the same temperature, or for the same length of time. 7. After coming out of the bath, the body should be rapidly dried, and gentle exercise taken.

279. *Cautions and Contra-indications.* The cold bath is inadmissible under the following circumstances :—1. During the menstrual period, and only with great caution during pregnancy. 2. In great plethora, or in cases where there exists a tendency to any active hæmorrhage, or apoplexy. 3. In persons affected with disease of the heart, particularly with dilatation or valvular obstructions; or in those having a tendency to disease of the heart. 4. In indurations, obstructions, or chronic inflammations of the internal parts of the body; likewise in all acute inflammations of these parts, more particularly of the principal viscera. 5. In loaded states of the bowels, more particularly if combined with a congested condition of the venous system of the abdomen. 6. In most cutaneous diseases, particularly in such as are apt, when suddenly repressed, to be followed by internal affections. 7. In great general debility, and where there does not exist sufficient power of reaction, more especially if there exist an habitually cold state of the surface. 8. In scrofulous disease; and it should be used with great caution when a predisposition to this disease exists. 9. It is less applicable in infancy and in old age than in youth or middle life.

280. *The Cold Bath is generally applicable* to those cases in which there is much languor and weakness of the circulation, accompanied by profuse perspirations, a relaxed state of the system generally, and a deranged condition of the nervous system, which are so frequently the consequence of debilitating diseases, or intense

study. In short, from whatever cause it may arise (disease of the internal viscera excepted), when great relaxation and debility exist, the cold bath, properly employed, will be found a valuable therapeutic agent.

281. *Therapeutic Uses.* *In Spasmodic Asthma*, many writers advocate the employment of the cold bath: it gives tone and vigour to the system; it should be employed only in the intervals, never during a paroxysm. Simply sponging the body is preferred by some to immersion. Sea-salt (oz. j. ad Aq. Oj.) may be added with advantage, and the body should afterwards be rubbed with rough towels or a flesh-brush. The best time for using it is immediately after getting out of bed in the morning. Sir T. Watson preferred the use of the shower-bath. *In the Chronic stages of Hooping-cough* the cold bath, or shower-bath, is sometimes attended with excellent effects.

282. *In Nervous Diseases, when unconnected with Disease of the Brain, and in those cases of Paralysis consequent on severe inflammatory attacks of the Brain and Spinal Column*, the use of the cold bath, particularly the shower-bath, is often attended with benefit; on the other hand, it sometimes fails altogether, or even aggravates the severity of the symptoms. *In Congestive and Hysterical Headaches*, the shower-bath may be used with advantage.

283. *In Chorea*, the cold shower-bath is a valuable adjunct to other treatment. Part of the good results, observes Dr. Radcliffe (ii. p. 140) is ascribed to the shock; part—a greater part, perhaps—to the reaction. Still, there are many cases in which the shock is not tolerated, and where more harm than good follows their use. With respect to hot baths and to warm baths, adds the same authority, the case is very different. A hot bath at bedtime has often seemed to have a marked calmative influence, and it is probable that much of the benefit ascribed by M. Baudelocque to sulphur baths is due to the high temperature of the water, or to the cutaneous irritation caused by them. There is much force in Dr. Hillier's remark (p. 236), that shower-baths are useful in the later stages of chorea, when the patient is not too timid and too much excited by them. These observations hold good with reference to *Epilepsy* and some other forms of *Convulsive Disease*.

284. *In some forms of Hysteria, in Hypochondriasis, and in Nervous Prostration*, after excessive study or debilitating disease, the shower-bath proves highly useful. A paroxysm of hysteria may often be arrested by the cold douche to the head, chest, or spine.

285. *In Spermatorrhœa*, cold hip-baths are stated to be of the highest value. The patient should begin by sitting in a hip-bath for five minutes three times a day, the water being about 65° F. The time is gradually increased and the temperature lowered, until the patient sits for twenty minutes, thrice daily, in water at 50°. In some cases the spine is sponged for three or four minutes before leaving the bath, and very often a shower-bath is used after the first daily sitting-bath, the head being protected by a conical cap-

Gentle exercise for five minutes before and half an hour after each of these processes, is ordered. It has been found particularly beneficial to persons who have been debilitated by a long residence in a hot climate. *In Prostatorrhœa,* the cold hip-bath is often of great service.

286. *In Leucorrhœa,* baths are often highly serviceable, but the condition of the patient must determine the choice of the form employed. The most simple is the "sponge-bath:" used night and morning, with water at first tepid and then quite cold, friction with a coarse towel being continued for some minutes subsequently. Then comes the "hip-bath," with either pure, salt, or medicated water, tepid at first, cold subsequently. If medicated, means must be taken to ensure the passage of the fluid into the vagina; friction, as above, should follow. With due care both these forms of bath, alone or together, may be used in all cases, however debilitated the patient may be; if headache follow, they should not be persevered in. For those who can bear it, the shower-bath or the cold plunge-bath is to be recommended. In cases which, from the severity of the symptoms and suddenness of their invasion, may be termed *acute,* the warm bath is of the greatest utility. (Dr. Graily Hewitt, p. 395.) The sponge-bath is most useful for women subject to *Menorrhagia,* and the hip-bath is frequently the means of keeping patients in health who would otherwise suffer constantly from profuse menstruation. Its good effects are especially noticeable at the climacteric period.

287. *Typhoid Fever.* The treatment of this disease with cold baths has been highly lauded by Dr. Cayley and others. By means of Dr. Cayley's method, the patient is lifted from his bed and swung into a bath, the temperature of which is lowered to 68° F., while the pulse is carefully watched. The patient's temperature is taken from time to time while he is in the bath, and in 20 minutes or less he is again swung and returned to his bed. Even after this his temperature falls some degrees, so that it is necessary to remove him from the bath before the temperature has reached the normal. The cold bath lessens the temperature as well as relieves the nervous and other symptoms.

288. *In Hyperpyrexia,* Wilson Fox and others have shown that the cold bath is the most powerful and useful method of treatment. Dr. Ringer, in his valuable article on "Cold Baths in Fevers," says that he has saved many lives by prompt employment of the cold bath.

289. The Shower Bath in its operation and effects is similar to the cold bath, but the immediate shock it communicates is much more violent, particularly if the quantity of water is great, the temperature low, and the fall considerable. Its indications and contra-indications are those of the cold bath (*ante*), and it is applicable to the same class of diseases. When the brain and nervous system are deranged, it often proves most serviceable. (See *Cold Bath.*)

290. The Hot Bath (98° to 112° F.) and the Warm Bath (92° to

98° F.) are very valuable therapeutic agents in many affections, when judiciously employed.

291. *The objects for which they are employed are*—1. To establish a sedative action on the nervous system. 2. To equalize the temperature of the whole body. 3. To modify the action of the skin, both as an exhalent and an absorbent organ, and at the same time to modify the texture of the skin. 4. To modify the frequency and force of the heart's action. 5. To equalize the distribution of blood throughout the system; thus, when a disproportionate quantity exists in the internal organs, it recalls it to the surface. 6. To relax the muscular system and all the external tissues.

292. *They should be used with caution, or are contra-indicated*—(1) in very gross habits, in plethora of all kinds, and in great obesity; (2) in persons predisposed to apoplexy, hæmorrhage, particularly hæmoptysis, also in organic diseases of the heart and great vessels; (3) in relaxation of the system, with a tendency to dropsy; (4) in all febrile diseases, whether accompanied with visceral inflammations or not, where there is a dry, hot skin, and an active circulation; (5) during the menstrual period and the latter stages of pregnancy. (Forbes.)

293. *Therapeutic Uses. In Inflammatory Attacks of Children*, the hot bath often proves signally beneficial; it may be repeated daily, or even two or three times a day. It determines to the skin, promotes diaphoresis, relaxes the muscular system, and keeps the surface clean, which is a point of no small importance.

294. *Insanity.* The continued application of cold to the head by means of the douche bath, or by pouring cold water upon it, while the patient lies in a warm bath, is often successful in calming excitement and in procuring sleep in acute insanity. The warm bath alone, taken for about half an hour, has a soothing effect, and may induce sleep, and its efficacy is said to be wonderfully increased by the addition of several handfuls of mustard, so as to produce a general redness of the body. (See also SINAPIS.) Brierre de Boismont professes to get very good results from employing the warm bath for eight or ten hours at a time; and Leidersdorf has used for three or four hours, and in many cases with marked calming effect, a bath constructed by Prof. Hebra, in which patients may be kept night and day at a definite temperature. Such a bath must obviously be avoided when the pulse is feeble, and when there is anything like commencing paralysis, and it is of no avail in cases of chronic insanity. The prolonged use of the shower-bath and of the cold bath, at one time much in fashion, is now justly abandoned. The shower-bath or cold douche may certainly be usefully employed in certain cases of *Melancholia*, where reaction does not fail to take place after it; and in cases of chronic insanity, with the purpose of rousing the patient and giving tone to the system; but it should never be continued more than three minutes, and it should not be employed with the aim of producing any special effect, but on general principles of improving the health. The good effects of the Turkish bath have been much vaunted by its

advocates, but an exact discrimination of the cases in which it is useful yet remains to be made. Packing in a wet sheet has sometimes a beneficial effect, and is commonly grateful to the patient. (Dr. Maudsley, ii. p. 59.)

295. *In Infantile Convulsions*, the warm bath, at 98°, is often most serviceable, cold or ice being simultaneously applied to the head. It is a measure which should never be omitted. The trunk should be immersed for ten or fifteen minutes. It requires to be used with caution in very plethoric children. *In Laryngismus Stridulus*, a hot bath may prove advantageous, if it can be used without fretting the child, a point carefully to be avoided.

296. *In Granular Disease of the Kidney*, the regular use of the warm bath every other evening, or oftener, is often effectual in removing restlessness, anxiety, and want of sleep. At the same time, Dover's powder, acetate of ammonia, &c., should be given, in order to promote diaphoresis.

297. *In mild forms of Dysentery*, Dr. Maclean has much confidence in the hot bath. He directs it to be brought to the bedside, to be kept at a high temperature, and the patient to remain in it until he feels faint; to be then quickly and carefully dried, put to bed, and given ipecacuanha (gr. xv.–xx.), which may require to be repeated in eight or ten hours. If the patient abstains from all fluid for some hours after taking the medicine, there is seldom much nausea or vomiting, provided the horizontal position is maintained, which it ought to be. The result, generally, is free action of the skin, rapid subsidence of the griping, and the appearance of feculent motions. Sometimes it is well to give a few drachms of castor-oil with a few drops of laudanum or chloroform. Turpentine epithems to the abdomen are advisable. The above simple treatment will suffice in a great many cases of that mild form of dysentery which follows chills without much charging the system with malaria, provided it be had recourse to sufficiently early. (Maclean, i. p. 119.)

298. *In Scarlatinal Dropsy*, the daily use of a warm bath, when it can be borne, is often of signal use, and it also proves serviceable in other *Dropsical Affections*, when the patient is not debilitated; subsequent friction adds greatly to its efficacy.

299. *In Diabetes*, the value of the warm bath is much insisted on, and in some cases gives temporary relief.

300. *In Prurigo*, Sir E. Wilson observes that the first point, and one of the most important, is the daily employment of baths. Their temperature should not be higher than 70° F., and they may consist of simple water with soap, or the alkaline bath, or sulphur bath. *In Syphilitic Eruptions*, the same baths prove highly useful, but Sir E. Wilson prefers in most cases the use of the vapour-bath.

301. *In Irritative and Inflammatory Affections of the Kidneys, Bladder, and Uterus, in Spasmodic Stricture of the Urethra, in the passage of Calculi, either renal or biliary*, and in many spasmodic affections of the bowels, the hot bath, or the hot hip-bath, proves highly serviceable and soothing.

302. *In Impassable Stricture of the Urethra*, a hot bath will often enable the surgeon to get a catheter through the stricture.

303. The Vapour Bath commonly employed in British practice is a small close cell or tent, in which the patient is either altogether or partially inclosed, and into which the vapour is conveyed by a simple apparatus. The external covering should be so constructed that the patient may breathe the air or vapour at pleasure, by excluding or including the head, through an aperture at the side or top. The effects of the vapour bath are very similar to those of the ordinary hot bath. It is applicable to most of the cases enumerated under the hot bath; and the same rules are observable in its use, but it seems more particularly useful in *dry, scaly Cutaneous Affections*, and in some forms of *Chronic Rheumatism*. Cases of *Hydrophobia* have also been reported to have been cured by its use.

304. Vapour baths are of great service in treating *Bright's Disease*. By promoting perspiration they relieve the kidneys, and effect elimination. In impending *Coma*, a vapour bath should be employed. It is necessary to watch the pulse, as fatalities have occurred during the use of vapour baths in the treatment of Bright's disease.

305. The Turkish Bath is at once one of the most useful and dangerous of remedies. There is no doubt that no one, even in apparent health, should pass through a Turkish bath without first having ascertained his fitness for it.

306. Combining the eliminating power of the hot and vapour baths with the tonic of the cold douche and plunge, it intensifies the shock and the reaction. In cases in which the bath is unsuitable no reaction occurs, and hence a very bad effect is produced.

307. Its use is indicated in *Rheumatic* and *Gouty subjects*, and in sufferers from *Strumous* and other *Dyscrasiæ*.

308. *Chronic Skin Diseases*, especially when associated with dyspepsia, are improved. Also the many conditions grouped under the expression "want of tone," as well as debility arising from overwork or other cause, show marked benefit from the employment of these baths.

309. Sea-bathing is one of the best tonic treatments we possess. In *Convalescence, in Nerve Prostration* from anxious and prolonged mental work, sea-bathing, when it can safely be indulged in, proves most useful. Dr. Phillips[1] enters in detail into the physiological action of the seaside bathing. He finds tissue change is promoted, and the general health improved.

310. Sea-bathing requires certain precautions. The best time is between two meals, about three hours after an early breakfast The exertion undergone—swimming, breasting the waves, &c.—should be carefully graduated to the strength of the patient. A "dip" and a run out are all a weakly person will with benefit bear at first. The practice of bathing infants in the sea is unwise, as the depressing nature of the fear engendered, more than counter-

[1] Mat. Med. and Therap. 1882, p. 194.

balances the good derived from the sea-water. Old persons bear sea-bathing badly, and in general it may be said that those who are subject to disease of the internal viscera should only have recourse to sea-bathing acting under advice, since the congestion following the immersion in the water is liable to tax prejudicially the already crippled viscera.

Dr. Phillips regards extreme anæmia as a contra-indication; and, indeed, it may be said generally that those persons whose hearts are little able to stand shock will derive more harm than benefit from sea-bathing in the open.

In cases where seaside bathing is impracticable, it is often of great use to employ the sea-water, or artificial sea-water, made by dissolving sea-salt. The benefit is felt, not only in general prostration, but in the rearing of delicate and especially strumous or rickety children.

311. Mineral Waters and Baths.

The classification which follows is based upon that of Braun, as given by Dr. Phillips (*op. cit.*).

I. Carbonic Acid Waters.

Neuenahr (Rhenish Prussia), Seltzer, Ilkestone (Nottingham). These waters are sparkling and refreshing, from the carbonic acid they contain. As a rule, the carbonates of soda, calcium, or magnesium are present.

Their therapeutic value lies in giving tone to the enfeebled gastric mucous membrane in chronic visceral disease—*e.g.*, *Gout*, also in *Rheumatism*. They promote intestinal peristalsis and increase the activity of the kidneys. These waters form a valuable vehicle whereby alkalies may be introduced into the body. Apollinaris and Seltzer waters are accessible as table waters.

II. Saline Waters.

(*a*) Purging Mineral Waters (Bitter Waters). Cheltenham, Leamington, Friedrichshall, Hunyadi Jaños, Pullna, Seidlitz, Epsom, Spa, Purton, Beulah Spa, Scarborough.

These waters contain the sulphates of magnesia and soda, with more or less chloride of soda.

By stimulating (in large doses irritating) the gastric mucous membrane, they produce purging and diarrhœa. They are mainly of use in congestive conditions of the portal system, in *Habitual Constipation*, &c. Where there is tendency to *Hœmorrhoids*, when *the Liver and Spleen are enlarged*, these waters are of service. Their prolonged use leads to emaciation and chronic dyspepsia. They are indicated more in the case of plethoric persons than in that of thin, ill-nourished individuals.

(*b*) Calcareous Waters. Buxton, Bath, Bristol, Rehme, Eilsen, Leuk, Weissenberg, Wildenberg, Lippespringe, Bagnères de Bigorre, Contrexeville, St. Arnaud, St. Galmier, and others.

These waters contain mainly the carbonate and sulphate of calcium and magnesium.

They act when taken internally as antacid and sedative to the mucous membrane of the stomach. Their tendency is to constipate.

As tissue, and especially as *bone* tissue formers, their merits have been urged, but have as yet received no sufficient proof. Their use is indicated in the *Chronic Diarrhœa and Acidity of some forms of Dyspepsia.* Cases of *Chronic Vesical Catarrh,* with *Gravel* and *tendency to Calculus,* are benefited by these waters. Bone diseases, *Osteo-malakia, Rickets, Fragilitas Ossium,* are said to be relieved by their use.

Chronic Skin Affections—e.g., Psoriasis, &c.—have been treated successfully with these waters.

(*c*) Common Salt Waters. Wiesbaden, Kissingen, Baden-Baden, Kreuznach, Homburg, Reichenhall, Harrogate.

Contain large proportions of chlorides, with some iodine and bromine.

The key-note to the action of these waters lies in the *rôle* undertaken by common salt in the economy. Its importance in gastric and intestinal digestion, lies in promoting circulation, and this leads to rapid renewal of the portal blood, as well as to a general increase of activity throughout the circulation. Peristalsis is increased and tissue change enhanced, while the vigorous circulation throughout the vessels supplying the alimentary tract leads to absorption and elimination of deleterious materials. In producing these effects, the degree of concentration of the water and the amount of carbonic acid present will largely influence. These waters are most useful in restoring *constitutions broken down by prolonged sojourn in India and the Tropics;* in *convalescence from debilitating diseases; in chronic Joint* (especially if *of a Rheumatic nature*) and *Skin Disease.*

(*d*) Alkaline Waters. Vichy, Ems, Neuenahr, Salzbrunn, Mont Dore, Bilin, Gieshübel, Apollinaris, Neris, Vals, Le Boulon, &c.

These waters contain mainly carbonate and chloride of soda, and more or less carbonic acid.

They owe their therapeutic value, it is believed, in great measure to the soda which they contain. As is justly pointed out by Dr. Weber, soda takes a most active part in promoting tissue growth and the general metabolism of the body.

To obtain the full advantage of alkalies, it has been incontestably proved that minute doses administered in copiously diluted solution is the best and indeed the only satisfactory procedure. It is in this form, then, that we find alkalies in these waters, and hence their merit. Even carefully prepared artificial mixtures made to replace the mineral waters fail to act as beneficially. And again, the temperature of the mineral water is matter of importance. The Vichy, Neuenahr, Mont Dore, Chaudes Aignes, and Neris waters are hot, and owe their peculiar merits in no small measure to this physical circumstance. These waters are especially of service in *chronic Dyspeptic states,* with the accompanying vitiated bodily nutrition. The deranged portal system, with *Sluggish Liver,* yields more particularly to the hot springs. The *Uric Acid Diathesis, Gout, Gravel, Stone*—all are indications for the employment of these waters.

In anœmia and *chlorosis* it will happen that iron is not tolerated. In such cases a course of alkaline water and baths proves highly serviceable, and prepares the way for the subsequent employment of iron, arsenic, or zinc.

III. Sulphuretted or Hepatic Waters. Thermal Waters: Aix (Saxony), Aix-la-Chapelle, Barèges, Borcet, Cauterets, Eaux Bonnes, Eaux Chaudes, St. Sauveur, Bagnères du Luchon, Panticosa, and many more. Cold springs: Eilsen, Neundorf, Langenbrücken, Harrogate, Moffat, Strathpeffer.

These waters contain in solution sulphides of the alkalies as well as sulphuretted hydrogen. Their taste is from this circumstance highly repugnant to many persons. It is, however, in most cases soon tolerated. The action of sulphur waters upon the economy has at present received no satisfactory explanation. Prolonged use leads to anæmia. The stools are blackened and bowels become confined, hence aperient waters should be taken in association with hepatics.

Hepatic waters are held to stimulate the body, and especially the skin and uterus, and hence its employment in *Chronic Uterine* and *Skin trouble*. *Rheumatism*, *Gout*, *Constitutional Syphilis*, are all reputed to be benefited by these waters.

It is usual to combine baths with drinking the water. Lead poisoning and allied conditions are certainly improved by hepatic water baths and water drinking.

IV. Chalybeate, or Iron Waters. Spa, Schwalbach, Tunbridge Wells, Driburg, Pyrmont, Harrogate, St. Moritz, Alexisbad, Brückenau, Brighton, Sand Rock, Isle of Wight—all contain iron, with or without the carbonates of the alkalies.

It is not necessary to do more than point out that iron, in its relation to red blood corpuscles is one of the most essential constituents of the body. Its deficiency leads to general mal-oxidation of the tissues, with, as a consequence, mal-nutrition: the ferruginous waters are among the best means of curing the defect of iron which various diseases engender in the organism. Thus, *Anœmia*, *Chlorosis*, *Convalescence after Exhausting Diseases*, especially in cases in which blood has been lost and its quality impaired—*e.g.*, subsequent to childbirth, uterine hæmorrhage, diphtheria, &c.—are all indications for a course of chalybeate waters.

V. Indifferent Thermal Waters. Gastein, Wildbad, Schlangenbad, Teplitz, Plombières, Leuk, Buxton.

The temperature varies from 80° to 150° F.

The action of these waters is fully considered under the section dealing with the therapeutics of water (*q.v.*).

312. *General Therapeutics of Mineral Waters.*

We have indicated above the properties peculiar to each class of mineral waters; it remains to point out a few of the leading circumstances which should guide in prescribing any of these modes of treatment.

Dr. Weber refers to the necessity there is that each case should

be considered upon its own merits, and the general state of the patient, his resistive power, his ability for incurring fatigue, &c., should influence us largely in our selection of a locality for his trial of any particular treatment. Again, it must be borne in mind that in most cases there are baths, and when possible these should be employed as adjuvants to drinking the waters.

In cases in which the patient goes to reside at a spa, the climate, altitude, and general physical peculiarities of the district have to be borne in mind.

Many of the mineral waters named above are imported, and these are commonly taken as ordinary medicines. In the case of natural aperient waters, a wine-glassful usually is an effective dose, and its action is enhanced by administering it in copious draughts of warm water upon an empty stomach.

313. Argenti Nitras. Nitrate of Silver. Lunar Caustic.

Med. Prop. and Action. Tonic, anti-spasmodic, and sedative, in doses of from gr. ¼ to gr. j. or gr. ij. In very large doses, it is a corrosive poison. If taken in small doses for a great length of time (two or three months), it occasionally communicates a peculiar blue appearance to the skin. When applied to the skin, mucous membranes, or ulcers, it produces a white mark, owing to the union of the salt with the coagulated albumen of the cuticle; this gradually becomes bluish grey, purple, and ultimately black, owing to the partial reduction of the silver. It is also a powerful tonic of the nervous system, but its *modus operandi* in the latter case has not yet been satisfactorily explained. Heller[1] carefully examined the blood and urine of epileptics who had undergone long courses of the nitrate, but failed to detect any traces of silver, whilst he found the fæces to contain, in the form of the chloride, the greater part of the silver which had been administered. Still we are justified in believing that a portion of the salt becomes absorbed, and exercises a tonic influence on the nervous system, independent of the local chemical action it may exercise on the mucous coats of the stomach and intestinal canal with which it comes in contact. Externally applied, it is stimulant, vesicant, and escharotic. The nitrate lightly applied three or four times to the moistened skin causes vesication in a few hours.

314. *Obs. on the use of the Nitrate of Silver.*

Precautions to be taken in employing Nitrate of Silver.

It should be administered in solution rather than in pill. The nitrate is certainly changed into chloride as soon as it comes into contact with the gastric juice, and hence the objection to its exhibition into bread-crumb pills can hardly be supported.

Owing to the liability to the deposition of silver salts in the rete, it is advisable before administering a course of the drug to warn the patient of such possible consequence.

In small doses silver salts constipate, a tendency to be counteracted during their administration.

As pigmentation is first to be detected in the mucous membrane of the mouth, any discoloration there is a sign to stop the silver.

Local applications, when producing unsightly staining, should be replaced by hyposulphite of soda (gr. x. to ʒj.). This removes the stain.

[1] Archiv für Physiol. i. p. 324.

Solutions of common salt are effectual antidotes to silver, a useful point to be remembered in accidental swallowing of lunar caustic sticks.

Silver salts, formerly largely employed as internal remedies, have at the present time had their use almost restricted to external applications.

As internal remedies, they are had recourse to in gastro-intestinal affections and certain disorders of the nervous system.

Dose of the Nitrate:—Gr. $\frac{1}{4}$–gr. 1 or more.

315. *Therapeutic Uses. Diseases of the Abdominal Viscera. In Chronic Gastric Ulcer,* nitrate of silver is useful; it acts beneficially in much the same class of cases as arsenic. The irritation and vomiting of gastric ulcer are sometimes relieved, as also happens in Gastralgia. Dr. James Johnson used to advise a pill of gr. $\frac{1}{2}$ of Argent. Nitr. combined with Ext. Hyosc. gr. ij.–iv. in hyperæsthetic states of the gastric mucous membrane, especially when associated with Hypochondriasis.

316. *Pyrosis* sometimes yields to this remedy, while *Chronic Gastritis,* according to Professor Wood, is better treated by silver than by any other drug.

317. *In Chronic Diarrhœa,* when the stools are watery or mucous, the nitrate has been found serviceable when other astringents and tonics have failed. *The obstinate Diarrhœa of Children* often improves under the following formula, originally proposed by Dr. Willshire:—℞ Argent. Nit. gr. j., Acid. Nitric. dil. ♏v., Mucilag. Acaciæ, Syr. Simp. āā ʒvj. M. Sumat. fʒj. 4tâ quâque horâ. It may be given safely to children of a year old. *In the Diarrhœa of Phthisis,* Graves regards nitrate of silver, in doses of gr. j. three or four times daily, one of the best remedies. *In the Diarrhœa of Enteric Fever,* Trousseau advised a pill composed of Arg. Nitr. gr. $\frac{1}{4}$–gr. j. with Pil. Sap. Co. gr. i.–ij.; but Dr. Harley regards it as inferior to Cupri Sulph. (*q.v.*)

318. *In the advanced Stages of Acute Dysentery, and in Chronic Dysentery,* no remedy in my hands has proved more uniformly useful than nitrate of silver, in doses of gr. $\frac{1}{2}$ to gr. $1\frac{1}{2}$ daily, reduced to fine powder and conjoined with Pulv. Ipecac. Co. in the form of pill. Its effects are often very remarkable, and even in young children, to whom I have prescribed it extensively, no ill effects have followed its use. Others have also testified to its value in these cases. It has also been extensively employed in the form of enema; and some few years since considerable attention was called to Dr. Hare's[1] plan of treatment of *Acute and Sub-Acute Dysentery,* which consisted, in the main, of first throwing into the transverse colon, by means of the flexible tube of a stomach-pump, large enemata of warm water or milk and water, 3, 4 or 6 pints, so as thoroughly to break down and bring away fæcal accumulations, and then to follow them up with enemata of Oijss.–Oiij. of distilled water, holding in solution gr. xv. of nitrate of silver. The solution thus applied directly to the ulcerated surface of the colon and lower intestines, was considered to hasten the curative process. Notwithstanding the testimony borne to the efficacy of this treat-

[1] Indian Ann. of Med. Sci. i. p. 486.

ment by Dr. Hare and some other medical officers in India, it has never come into general use. In obstinate cases, if it be determined to give this treatment a trial, the patient should lie on the left side, and the tube should be introduced with the greatest caution per rectum, to the extent of about six or seven inches, or at any rate till it reaches the sigmoid flexure of the colon, and the fluid injected gently. It is not always easy or even practicable to introduce the tube as directed above; the natural sharp fold at the junction of the rectum and colon may cause obstruction; and Mr. Erle has shown that the bowel not infrequently makes a horizontal curve to the right before descending into the pelvis. Great gentleness is therefore requisite in introducing the tube, otherwise the intestine may be perforated, or other serious mischief ensue. An attempt to re-introduce the use of these large nitrate enemas in dysentery has recently been made by Dr. Horatio Wood of Philadelphia, and Dr. S. Mackenzie, but both its safety and its efficacy in a large number of cases is problematical. Dr. Wood carried the dose to ʒj. of the Nitrate ad Aq. Oiij.; but Dr. Mackenzie[1] limits it to half this quantity. The results, he states, have been so encouraging that he is anxious it should be tried by others. In obstinate chronic cases, when ulceration is confined to the lower part of the intestine or rectum within the reach of an ordinary enema, a solution of the nitrate (gr. ij.–iij.)ʒj in distilled water, with or without a portion of opium, in some cases hastens the process of cicatrization.

319. *In Cholera* it has been tried, but it is a drug of uncertain value in this disease.

320. *Diseases of the Genito-Urinary System. In Amenorrhœa,* the practice advocated by Lubanski, Egan, and others, of applying the nitrate in substance to the os uteri prior to the usual menstrual period in obstinate cases, is reprobated by Dr. West (p. 44) as uncertain and unsafe.

321. *In Leucorrhœa,* the nitrate in solution (gr. iij., ad Aq. Dest. ʒj.) has been advised as a vaginal injection. Dr. Hudson[1] states that in *Uterine Leucorrhœa* he has derived great benefit from the internal administration of the nitrate. He relates several cases illustrative of its efficacy. The following formula is advised:— ℞ Argent. Nit. gr. ¼, Opii gr. ¼, Pulv. Rhei, Ext. Hyoscyam. āā gr. j. M. ft. pil. in die sumend.

322. *In Gonorrhœa,* the abortive treatment by the early use of strong injections of the nitrate (gr. xv.–xx. ad Aq. Dest. ʒj.), and by the administration of copaiba or cubebs in large doses, was at one time much in vogue; but "the success which attends either of these methods (observe Hill and Cowper, p. 507) is so small, while the dangers which attend them are so great, that we have abandoned them." The reason why abortive treatment is now generally discarded, they add, is that dangerous reaction is often induced by it. Gangrenous inflammation of the urethra, inflammation of the neck of the bladder, prostatitis, orchitis, bubo, and stricture have all

[1] Lancet, April 22, 1882. [2] Dublin Journ. xvii. p. 238.

been known to follow the use of caustic injections; whilst large doses of copaiba or cubebs in the first stage of the disease, is apt to excite congestion of the kidneys, or to cause violent vomiting and purging. (See also ZINCI SULPHAS.) In the advanced stages, when inflammation has subsided, a weak solution of the nitrate (gr. ij. Aq. Dest. ℥j.) forms a useful injection, especially when the discharge is white and moderately copious. Like all injections, it should be weak at first, and never sufficiently strong to excite more than a few minutes' smarting.

323. *In Chronic Urethritis in the Female*, Dr. Braxton Hicks states that the solid nitrate is a very efficient though painful application. It should be held in a small caustic holder on the end of a stilette, and sliding easily within a small silver tube, from which the caustic can only be made to project a short distance. The nitrate should be sheathed in the tube when passed into the urethra, and then, being projected beyond the tube, should be slowly withdrawn. By this means the mucous membrane is lightly touched throughout its whole extent. It is more painful than tannin (*q.v.*), but the pain soon passes off, and in a day or two much relief is obtained. It should be repeated in a week, and a third time at the same interval, if required.

324. *In Ulceration of the Os and Cervix Uteri*, the solid nitrate was till quite a recent period held in high repute, but has now fallen into comparative disuse. According to Dr. West (p. 122), it is not in general suitable to these cases, as its application is often followed by pain and also by bleeding. He prefers the Acid Nitrate of Mercury (*q.v.*). Dr. Atthill[1] goes further, remarking that he can with confidence say that, as an application in disease of the body of the uterus or of the cervix, the nitrate is perfectly useless. In cases of *Vaginitis*, however, he adds, it may be applied with advantage. It must be applied through a speculum, and the surface of the vagina well brushed over with a solution (gr. xx.–xxx., Aq. ℥j.). It may be repeated every two or three days. Dr. West (p. 405) states that in *Cancer of the Uterus* a solution of the nitrate (gr. xx.–xxx., Aq. ℥j.) injected immediately, into the diseased tissue, has the effect of destroying the bad odour, and of hastening the separation of the slough.

325. *In Pruritus Pudendi*, the application to the vulva of a twenty-grain solution of the nitrate sometimes affords notable relief. At first it may be used daily, then every other day, and so on. The same application may also be employed with advantage in *Pruritus Ani*.

326. *Spermatorrhœa.* Sir E. Home was the first who recommended cauterizing the urethra as a means of arresting involuntary spermatic discharges. It was adopted by Lallemand, who strongly advocated the practice as the most certain and efficacious. In England it has also met with an able advocate in Dr. Ranking, of Norwich. There can be no doubt, however, that, used injudiciously, it is capable of doing much mischief. Dr. Phillips (p. 398) states that he has seen serious consequences follow its use.

[1] Med. Press, Dec. 31, 1873.

327. *Incontinence of Urine in Children.* In confirmed cases, after the failure of other treatment, especially for those who have arrived at puberty or thereabouts, a mild caustic solution (Argent. Nit. gr. x., Aq. ℥j.) to the prostatic urethra has proved successful in the hands of Sir H. Thompson (p. 163). A stronger solution may be tried should this fail.

328. *Indolent Bubos* are sometimes stimulated to healthy action by the application of a strong solution of the nitrate, or the solid nitrate, lightly to their surface. *In Acute Orchitis*, Mr. Furneaux Jordan[1] advocates the application of a strong solution to the scrotum, followed by gentle pressure. Several years, he states, he has employed this treatment with unvarying success. Mr. G. Cowell[2] also bears testimony to the efficacy of the plan of pencilling the surface of the scrotum, previously put on the stretch and moistened, with the solid nitrate. It causes some smarting for a short time, and sometimes vesication. Rest and a suspensory bandage should be enjoined.

329. *In Hæmaturia arising in connection with vesical tumour,* Sir H. Thompson (p. 168) states that he knows nothing so valuable as injections into the bladder of nitrate of silver, commencing with a very weak solution. *In Chronic Cystitis,* he also recommends (p. 150) injection of nitrate, certainly not more than gr. j. to 4 oz. of warm water to commence with, going up to about ½ gr., or gr. j. at the most, to the ounce. *In Chronic Inflammation of the Prostate,* in exceptional cases, where chronic gleet is a prominent symptom, the application of a solution of the nitrate (gr. v.–x. Aq. ℥j.) to the prostatic urethra may be very serviceable (Sir H. Thompson, p. 156).

330. *Spasmodic Diseases. In Chorea and Epilepsy,* prolonged courses of the nitrate were formerly much in vogue, and many cases cured by these means are on record; but the danger of "turning blue," taken in connection with the fact that other remedies of equal if not greater efficacy have been discovered, has tended to bring it into comparative disuse.

331. *In Spasmodic Asthma,* a course of the nitrate, gr. j. daily in the form of pill, appears in some cases to act beneficially in reducing the force and frequency of the paroxysm. I have seen benefit from it when thus administered.

332. *In Hooping-cough.* After the acute stage is passed, the nitrate is strongly advised by Trousseau. He uses the subjoined formula :—℞ Argent. Nit. gr. ½, Syr. Simpl. f℥ss., Aq. Dest. ℥j. M. The dose for a child of one year old is a teaspoonful. It is probably inferior to alum (*q.v.*). Dr. McNutt[3] speaks highly of the practice of treating hooping-cough by the local application of a solution of the nitrate (gr. xv. ad Aq. ℥j.) by means of a spray atomizer, but there are great difficulties in the way of applying it in the case of young children, and if it causes struggles or fright, and thereby induces a

[1] Brit. Med. Journ. Aug. 22, 1868.
[2] Practitioner, Feb. 1872.
[3] Boston Med. Surg. Journ. Aug. 16, 1871.

violent paroxysm of cough, it will do more harm than good. It seems hardly worth the risk. Dr. Eben. Watson[1] relates several cases cured by the application of the nitrate (gr. xv. ad Aq. ℥j.) to the glottis.

333. *Diseases of the Mouth and Throat. In Diphtheria*, an application formerly recommended was a solution of the nitrate (1 part to 3 of distilled water). It should be well applied to the patch and the surrounding turgid mucous membrane. Dr. Morell Mackenzie (p. 163) speaks disparagingly of the nitrate in these cases, and says it is being generally abandoned by those who have had experience in recent epidemics. In fact, he adds, the profession has given up the use of caustics altogether, being convinced that they rather aggravate than check the local process.

334. *In Croup*, its efficacy is maintained by the late Professor W. Mackenzie,[2] of Glasgow, who applied a strong solution (gr. xx. Aq. ℥j.) by means of a large camel's-hair pencil to the whole of the lining membrane of the fauces once or twice a day, according to the severity of the symptoms. *In the Sore Throat of Scarlet Fever*, Dr. E. Copeman[3] speaks highly of a solution of the nitrate (gr. iv.–viij. ad Aq. ℥j.) applied by means of a brush or syringe. It is specially indicated in those cases in which there is a profuse ichorous discharge from the throat and nostrils, with disposition to sloughing ulcers in the phrarynx: here, he says, there is no remedy so successful as the nitrate. In ordinary *Relaxed Sore Throat* and in *Chronic Laryngitis*, solutions of the nitrate (gr. iv.–viij. Aq. ℥j.) have been recommended by high authorities; but Dr. Morell Mackenzie (p. 287) states that it does not appear to him that the nitrate acts more beneficially than other mineral astringents.

335. *In Chronic Bronchitis*, accompanied with profuse muco-purulent discharge, Dr. Phillips (p. 402) states he has often proved the efficacy of a spray containing a solution of the nitrate (gr. j.–iv. Aq. ℥j.) This he finds to alter and restrain the secretion in a satisfactory manner. A stronger solution (gr. xx.–xxx. Aq. ℥j.) he has found of much service in the early stage of *Laryngeal Phthisis:* the practice, however, is objected to by Dr. L Thomas.[4] Dr. Gibb found a solution of the nitrate applied to the larynx very beneficial in *Functional Aphonia* arising from paralysis of the vocal cords, and it has been found equally serviceable in *Clergyman's Sore-throat.* In all these cases the solution may be applied by means of a probang and sponge, or in an atomized state by means of the spray producer. *In Aphthæ*, occurring in the advanced stages of acute or in chronic diseases, Dr. Symonds advises a solution of the nitrate (gr. x. ad Aq. ℥j.) to be applied with a brush once or twice daily.

336. *Diseases of the Eye. In Gonorrhœal and in the severer forms of Purulent Ophthalmia*, a solution of the nitrate, varying in strength from gr. x. to gr. xxx. Aq. ℥j., according to the severity of the

[1] Dublin Med. Press, Feb. 1850.
[2] Glasgow Med. Journ. July 1881.
[3] St. George's Hosp. Reps. 1870.
[4] Brit. Med. Journ. 1878.

case, is a very effectual application. The lids should be everted, and the conjunctival surfaces painted over with the solution, which should be allowed to remain a few seconds so as to whiten the parts, and then be washed off by gently syringing over the granular surface a stream of cold water, or what is better, a solution of common salt (gr. x. ad Aq. ℥j.), to wash away and neutralize all the surplus nitrate, so as to prevent its irritating the eye, or blackening the ocular conjunctiva. This should be repeated once daily, and in very bad cases a second application may be necessary. When the lids are so swollen that they cannot be everted, two or three drops of a weaker solution of the nitrate (gr. ij.–x. ad Aq. ℥j.) may be dropped twice a day into the eye after it has first been cleansed by syringing away the discharge with cold water. During the intervals, in all cases, lint soaked in cold or iced water may be kept applied over the eyelids. Constitutional treatment is most important. From the very commencement of an attack, the strength of the patient should be supported by tonics, diffusible stimulants, and a liberal diet. Having first acted on the bowels by a moderate purgative, quinine (gr. ij.), or cinchona with the mineral acids, should be given every four hours. If there be much pain or irritability, opium should be given, either in small quantities frequently repeated, or in one full dose at bed-time. When there is heat of skin, with thirst and a furred tongue, an effervescing mixture with ammonia should precede the use of tonics. The diet should be one with meat or beef-tea, and with a certain amount of wine or brandy, according to the state of the patient. This is stated by Mr. George Lawson[1] to be the best treatment of gonorrhœal ophthalmia, and also of the severer cases of purulent ophthalmia.

337. *For the cure of the muco-purulent discharge dependent on granular lids resulting from Purulent Ophthalmia*, the same authority has found most benefit from a solution of the nitrate (gr. v.–x. Aq. ℥j.) dropped into the eye, and after letting it remain thirty or forty seconds, to allow it to take full effect, washing off the surplus with a stream of cold water or a weak solution of common salt. *For the Purulent Ophthalmia of Infants* the strength of the solution should not exceed grs. iv. ad Aq. ℥j.

338. *In Chronic Inflammation of the Eyelids and superficial Structures of the Eye*, Mr. Liebreich[2] relies almost exclusively on a ten-grain solution of the nitrate. *In Granular Conjunctivitis, Scrofulous Ophthalmia*, and *Ophthalmia Tarsi*, this application may likewise be employed with advantage. Speaking of its use in granular disease of the conjunctiva, Mr. Nettleship[3] directs this solution to be applied with a camel's-hair brush daily, or three times daily, according to the effect produced, adding that it cuts short most inflammatory attacks with great certainty, and very much reduces the roughness and redness of the lids, unless of very old standing. In a great many cases nothing else is required. Should it fail, a solution of double strength, or the nitrate in substance, may be used.

[1] Practitioner, Dec. 1868.
[2] Lancet, Dec. 2, 1871.
[3] Brit. For. Med. Rev. Jan. 1875.

If it cause much pain, use a cold compress. *In Epiphora*, a solution of the nitrate (gr. iij. ad Aq. ℥j.) once or twice daily is sometimes productive of benefit. *In Pterygium*, especially when this is combined with catarrhal conjunctivitis, benefit occasionally follows its use (Mackenzie). *In Indolent Ulcers and Opacity of the Cornea*, a collyrium of the nitrate (gr. j.–iv. ad Aq. ℥j.) often proves serviceable.

339. *Exanthematous and Cutaneous Affections.* *In Small-pox*, to prevent pitting, the practice of opening each vesicle on the third or fourth day of the eruption, and touching each with a stick of the nitrate scraped to a point, was advocated by Velpeau and other French writers, but the process is tedious, painful, and, as has been shown by Girardin, not without danger. In place of this, Mr. Higginbottom recommends the face to be washed on the fourth or fifth day with a strong solution (gr. xx. Aq. fl. drm. j.); but this Mr. Marson pronounces as far too strong, as it would blister the whole surface, if used; half this strength, he thinks, would suffice. As a local application in *Herpes Zoster*, it is favourably spoken of by Sir E. Wilson and others.

340. *In Erysipelas*, the value of the nitrate as a means of subduing external inflammation was first pointed out in 1829 by Mr. Higginbottom. After forty years' experience in its use, he maintained that for this purpose no agent is so safe, powerful, and efficacious as the nitrate.[1] He directs the affected part to be well washed with soap and water, then with water alone, to remove every particle of soap, which would decompose the nitrate, and then to be wiped dry with a soft towel. The solution of the nitrate (gr. lxxx. Aq. Dest. ℥iv.) is then to be applied two or three times carefully over the whole of the inflamed surface, and beyond it on the healthy skin to the extent of two or three inches. It may be applied by means of a piece of clean linen attached to the end of a short stick. In about twelve hours it will be seen whether the solution has been well applied; if any of the inflamed surface be found unaffected, it must be re-applied.

341. *In Pemphigus*, after the bullæ have burst, and excoriations remain, Sir E. Wilson found that the best application to promote a cure was a solution of nitrate of silver (gr. ij. ad Aq. ℥j.). *In Molluscum Simplex*, he advises touching the tumours with the solid nitrate; and in some instances he opens the tumour with a lancet, and applies the nitrate to the interior. *Erythema Infantum* is greatly benefited by being pencilled with a weak solution of the nitrate (gr. i.–ij. ad Aq. ℥j.). *In Frambœsia, or Yaws*, Mr. Mason[2] derived great benefit from the direct application of the nitrate to the tubercles; and in one recent case, this treatment being continued for a few months, the papules disappeared, and no other tubercular yaws were formed. *In Lupus*, the nitrate is a useful local application. It may be commenced in solution (gr. x. ad Aq. ℥j.), and the strength rapidly increased; and after a few applications, the solid nitrate may be resorted to. Dr. Purdon gives the

1 Practitioner, Jan. 1869.

2 Edin. Med. Surg. Journ. vol. xxxv.

patient chloroform, and then bores the nitrate deep down below the surface of the ulcer. His treatment seems to have been very successful. Graves speaks highly of the value of a strong solution of the nitrate (gr. x.–xv.–xx. ad Aq. ℥j.) in *Tinea Capitis*, but there are better and safer applications. Obstinate cases of *Psoriasis*, *Porrigo*, and *Impetigo* often improve under the local use of the nitrate in substance or in solution. If used in substance, it should not be applied extensively at once, but small portions should be successively cauterized at intervals of a few days.

342. *To Sore or Chapped Nipples*, nitrate of silver is very effectual. The nipple should be first carefully dried, and touched lightly with a sharp point of the nitrate, care being taken to insinuate the pencil into the fissures. The part is then to be washed with a little warm milk and water. The pain which this causes soon subsides, and a few dressings of zinc ointment will complete the cure.

343. *To Corns*, the local application of the solid nitrate is advised by Mr. Higginbottom. The corns should be first soaked in hot water and pared down. The nitrate should be lightly passed over the surface, and repeated every ten or twelve days until the corn is destroyed. Mr. Ormsby[1] states that he has repeatedly tried this treatment, and that it has rarely failed in his hands; but, he adds, it must be persisted in. *In removing Warts*, it is also very effectual; it may be repeated once or twice a week until their removal is effected. *In Onychia*, a resolution of the disease has apparently followed blackening the diseased surface with the nitrate in substance or in solution. *In Carbuncle and Boils*, the application of the solid nitrate affords the most speedy means of cure. It should be applied freely over the surface, and repeated, if necessary, once or twice after intervals of two days. A soft pad of dry lint should be then applied, and kept *in situ* by means of strapping and a bandage. (Mr. Cowell.) Liston[2] indeed regarded it almost as a specific. *Severe Hæmorrhage from leech-bites, or after the extraction of teeth*, may often be effectually arrested by applying the nitrate, sharpened to a point, to the bleeding part.

344. *In In-growing Toe-nail*, Mr. F. Mason has followed with much success the plan of applying a sharp-pointed stick of the nitrate to the base or under-surface of the granulations, and then carefully inserting a small piece of dry lint, or lint dipped in black wash, and then surrounding the whole toe in water-dressing. It is essential that the nitrate be finely pointed, and be applied freely to the base of the granulations.

345. *In many forms of Ulcers*, the nitrate is effectual in establishing a healthy surface, and promoting cicatrization. *To healthy Ulcers, if extensive, or, if exuberant granulations exist, to weak and indolent Ulcers, and also to irritable Ulcers*, the nitrate, either in substance or solution (gr. j.–vj., Aq. Dest. ℥j.), may be used with advantage.

346. *Other Diseases. In Deafness depending upon a thickened state of the Membrana Tympani*, Mr. Toynbee found great improve-

[1] Med. Press, April 1874.

[2] Surgery, part ii. p. 317.

ment follow the use of a solution of the nitrate (gr. xxx.–lx., Aq. ℥j.) Proceeding from the exterior of the orifice of the meatus, the passage may be touched to an extent varying from one-half to two-thirds of its length, every three or four days. In some cases, the membrana tympani may also be washed with a solution (gr. vj., Aq. ℥j.).

347. *In Hysterical Headaches*, Dr. Graves speaks highly of the efficacy of nitrate of silver in considerable doses. When the paroxysm has abated, the greatest benefit, he observes, may be derived from the nitrate, continued for five or six days at a time, in doses of gr. $\frac{1}{2}$, four or even six times daily. When the bowels are constipated, he states that there is no better combination than the nitrate with minute doses of Pil. Coloc. Co., a formula recommended by Dr. J. Johnson, and which he has found invaluable, not merely in the headaches of hysterical young women, but in those of men, particularly the habitual *Stomach Headache* to which delicate and literary men are so subject. *In Facial Neuralgia*, Romberg[1] often found the nitrate (gr. j. several times daily) of great but not permanent benefit.

348. *The pain of Syphilitic Fissures of the Tongue* is much relieved by dropping into them, with a fine brush, a solution of the nitrate sufficiently strong to destroy the surface, and cause a small eschar. (Hill and Cooper, p. 438.)

349. *Poisoned Wounds, Venomous Bites.* In these the solid nitrate sharpened to a point has been used, and sometimes with apparent success, as a caustic. To be of any service it must be applied immediately after the infliction of the injury, and be inserted freely into every recess and sinuosity of the wounds, so that no part of the injury escapes its action. It is inferior in efficacy to nitric acid, and should only be employed when other more powerful caustics are not available. Neither should it be used to the exclusion of other measures. Mr. Youatt ascribed to it peculiar virtues in the *Bite of a Mad Dog*, as a *Preventive of Hydrophobia*, but this appears to have no foundation in fact.

350. *To Burns*, Mr. Skey directed in the case of infants or young children, that the burnt surface, if not very extensive, be washed with a solution of the nitrate (gr. v.–vj., Aq. ℥j.), and immediately afterwards enveloped in cotton wool. For adults, the strength may be gr. xij.–xv., Aq. ℥j. Should pain return, the solution may be advantageously resorted to at an early stage of treatment.

351. *In Progressive Locomotor Ataxy*, the only remedy, according to Dr. Althaus, which seems to have done some good in a very large proportion of cases, is nitrate of silver, in doses of gr. $\frac{1}{10}$–$\frac{1}{2}$ two or three times daily. Professor Wunderlich, of Leipzig, was the first who employed it; and in 1862 MM. Charcot and Vulpian tried it in five cases, in each with benefit. Since then it has been employed in most cases of ataxy, and with somewhat variable success. See also next section.

[1] Dis. of Nerves, i. p. 54.

352. In some it so disagreed that it was necessary to discontinue its use; in others it had little or no effect; while in the majority of cases, it has proved, if not curative, at least very useful, and is the one upon which most reliance can be placed. The validity of Charcot and Vulpian's deductions has been impugned by Dr. Topinard,[1] who gave it a fair trial in seventeen cases; of these, in twelve no good results followed (indeed, one was worse); in the other five there was some amelioration. He commenced with gr. $\frac{1}{12}$ daily for 90 days, interrupting the course every eighth day for a week, and then gr. $\frac{1}{8}$th was continued for four months. Dr. Althaus combines its use with hypophosphite of soda, and thus given, it seems to do more good than either of these remedies given singly. The safest plan is to give it for four or six weeks consecutively, and then discontinue it for two or three weeks, giving in the meantime a slightly aperient mineral water. Recourse may then be had again to the nitrate, and continued for a month or two. On the appearance of the slightest blue coloration of the gums, which should be inspected from time to time, it should be discontinued. Sulphur baths may be simultaneously employed.

353. Argenti Oxidum. Oxide of Silver.

Med. Prop. and Action. Tonic, sedative, and antispasmodic, approximating in its operation to the nitrate, over which it possesses the advantage of being milder in its effect, and less liable to produce discoloration of the skin. Salivation occasionally follows its use, and under its continued administration the stools assume a dark or black colour. Dr. Phillips (p. 409) states that he has never seen irritation, salivation, or discoloration of the skin follow its use; it should not, however, he adds, be continued for many weeks consecutively. It has been considered to act specifically on the uterine system, but this is doubtful. The rules given for the administration of the nitrate apply equally to this preparation. Externally applied, it is astringent and mildly caustic; it may be used in the form of ointment (gr. lx. ad Ung. ʒj.)

Dose:—Gr. $\frac{1}{2}$-ij., twice or thrice daily, in the form of pill.

354. *Therapeutic Uses.* Are practically the same as those of the nitrate. In either case the chloride becomes developed in the stomach, and the ensuing action is, as far as *à priori* reasoning is reliable, the same.

The oxide is used in doses of from gr. $\frac{1}{2}$ to gr. j. thrice or more daily.

355. Argenti Phosphas. Phosphate of Silver.

Med. Prop. and Action. A tribasic salt, prepared by precipitating a solution of silver nitrate with a solution of trisodic orthophosphate, washing the precipitate with distilled water, and drying in the dark. The result is a heavy powder of a lemon-yellow colour, which darkens slightly on exposure to the air. Dr. A. L. Hamilton,[2] who has introduced this salt to notice, states that it possesses advantages over the other silver salts which entitles it to a fair trial. He prescribed it for months in doses of gr. $\frac{1}{3}$ to $\frac{1}{2}$, without any discoloration whatever of the skin, or any of that gastric irritability that so often follows the use of the nitrate. At the same time he found its therapeutic effects much

[1] De la Ataxie Locomotrice, Paris, 1864. [2] Practitioner, May 1881.

more pronounced. It is best given with some such excipient as glycerine, as vegetable substances decompose it, so that it cannot be made into pills with Conf. Rosæ, &c.

356. *Therapeutic Uses.* It is regarded as of special value (1) in cases of more or less acute *Myelitis with disturbance of the bladder and rectum*; (2) in cases of *Sclerosis of the Nervous substance.*

357. Armoraciæ Radix. Horse-radish Root.

Med. Prop. and Action. Stimulant, antiscorbutic, and diuretic. Taken internally, it causes warmth in the epigastrium, expels flatus, promotes digestion, and increases the appetite; under its use the cutaneous and urinary secretions are increased. Taken in the form of hot infusion, it acts as a speedy emetic. Locally applied, it is irritant and vesicant, and when chewed causes a copious flow of saliva. Its activity resides in a volatile oil, identical with oil of mustard. In India, an excellent substitute for it exists in the root of Moringa pterygosperma, *Gærtn.* or Horse-radish Tree.

Dose:—Of the Compound Spirit, fl. drm. j.-ij. *Of the Infusion*, (L. Ph.), fl. oz. j.-ij. Water at 150° F. to 180° F. makes the strongest infusion. (Squire.)

358. *Therapeutic Uses. In Dropsical Affections*, it was much employed by Sydenham and the older physicians; and Rayer observes, that of all diuretics it is the one which appears to him to offer the best chance of success. The compound spirit is an excellent adjunct to diuretic mixtures in this class of cases: it is too much neglected.

359. *In Paralytic, Rheumatic, and Arthritic Affections*, poultices of the fresh root form a ready counter-irritant. If allowed to remain on too long, it will cause vesication. It may also be given internally.

360. *In Vomiting connected with Uterine Affections*, Dr. Tilt states that he has seen relief from the patient taking repeatedly a small portion of horse-radish scraped and moistened with vinegar.

361. *Toothache* is occasionally relieved by slowly masticating a piece of the fresh root, in virtue of its sialogogue action. An infusion has been found useful as a gargle in *Aphonia* and *Hoarseness* arising from relaxation of the throat.

362. Arnicæ Radix. Arnica Root.

Med. Prop. and Action. Nervine, stimulant and diaphoretic; in over-doses an acro-narcotic poison, producing vomiting, purging, vertigo, tetanic twitchings of the muscles, and convulsions. The flowers partake of the same qualities even in a more marked degree; according to Van der Kolk, they are more exciting and less tonic than the root. From Mr. Balding's trial with it (*infra*) it would appear to be a powerful cardiac sedative. Its activity resides in an alkaloid, *Arnicine*, and is a bitter acrid extractive, analogous to *Cystisin*. The powdered leaves are occasionally used as an errhine. Externally applied in the form of tincture, it is employed as a sedative and resolvent in glandular swellings, rheumatism, and bruises; but it is necessary to watch its effect when thus used, as a very troublesome eruption is apt to result when too long persevered in. (Dr. Fuller.) When the infusion is prepared for internal use, it should be carefully filtered, otherwise it is apt to produce much gastric irritation.

Dose:— Of the Powdered Root, gr. v.–x. (?) *Of the Tincture* (Arnica Root oz. j., Rect. Sp. Oj.), fl. drm. j.-ij. *Of the Infusion*, see *infra.*

363. *Therapeutic Uses. In Idiopathic Mania*, when it passes into the chronic stage, when, as the excitement decreases, the patient becoming weaker, quieter, and apathetic, the pulse small, the hands cool, the head, however, remains hot, or when signs of imbecility or paralysis present themselves, Prof. Van der Kolk (p. 116) speaks highly of the value of arnica, stating most gratifying results have followed its use. In persons exhausted by *Onanism*, he states that he has seen recovery follow the use of arnica root. Alibert[1] reports favourably of it in *Paralysis*; and Dr. Meyer records a case of *Paralysis of the Bladder* which yielded to its use. *In Amaurosis*, it has long been a popular remedy in Germany; an obstinate case cured by its means is related by M. Maunoir.

364. *In Acute Pulmonary Affections*, Mr. Balding[2] speaks highly of the value of the tincture of arnica in doses of ♏x. every three or four hours. He mentions a case of *Acute Pleuro-pneumonia* and another of *Hæmoptysis* connected with tubercular disease, in which its action, especially in controlling the heart's action, was very marked and beneficial.

365. *In Rheumatic Gout*, Dr. Fuller reports very favourably of the tincture (♏ x.–xxx.) or infusion of the flowers or of the root (℥vj. Aq. Ferv. Oj.) in doses of ℥iv.–℥j. in combination with cod-liver oil, vegetable bitters, and alkalies or the mineral acids, according to the nature of the case. It is said to be most useful to the feeble and exhausted, acting as a fillip to the various organs. Should nausea or headache occur, its use must be discontinued.

366. *To Bruises, Sprains and Lacerations*, the tincture, used as a liniment or diluted as a lotion, is extensively employed as a local sedative, and in most cases is very effectual. Dr. Garrod considers that the efficacy of the remedy is dependent on the spirit contained in it; but this view is not supported by common experience. *To Chilblains*, the tincture is an extremely useful application (Dr. Purdon).[3]

367. *In Relapsing Mammary or Milk Abscesses*, Dr. Meissner[4] speaks of a weak solution of arnica as a useful internal remedy. Under its use not only was further suppuration prevented, but half-developed abscesses disappeared.

368. Acidum Arseniosum. Arsenious Acid. White Arsenic.

Med. Prop. and Action. The physiological action of Arsenic has been made the subject of careful observations by Dr. J. Cleland.[5] According to his view, the action of Arsenic is two-fold—(1) upon the blood, (2) upon the skin. Its action on the blood arises from its property of direct combination with the blood globules. This combination is made at the expense of the oxygen, of which arsenic takes the place. This change in the globules lessens the tissue changes, or the denutrition of the body. This action is evidenced by the diminution in the amount of the urea secreted, and by reduction of the temperature of the body. Its action upon the skin is caused by its power of pro-

[1] Elémens de Thérap, p. 141.
[2] Lancet, Dec. 24, 1870.
[3] Journ. of Cutaneous Med. Dec. 1870.
[4] Med. Press, Nov. 22, 1865.
[5] Ranking, Abstracts, liv. (1871), p. 298.

ducing injection of the superficial capillaries, whereby increased nutrition of the epithelial surface takes place with a rapid growth of epithelium. The three prominent effects of arsenic, the silvery tongue, the plump appearance of the face, and the red conjunctiva, are indications of this action, and are explained by it. (Abstract in Braithwaite, vol. lxiii.) The silvery tongue described by Begbie is generally the first to appear, and Dr. Cleland thinks that he has never seen any therapeutic effect produced without the tongue having assumed this peculiar silvery appearance. Arsenious acid, in continued doses of from one-sixtieth to one-twelfth of a grain, is tonic, increasing the appetite and improving the quantity and quality of the secretions. In somewhat larger doses, it is a powerful anti periodic. When swallowed, or applied to a denuded surface, it is absorbed into the system, and has been detected in the blood, in the urine, and other secretions; also in the liver, spleen, kidneys, stomach, and muscles. It possesses a powerful antiseptic property, arresting, in a manner almost peculiar to itself, the process of putrefaction; the stomach and alimentary canal of persons who have died from its effects have been found in a perfect state of preservation months after interment. Post-mortem examinations of persons who have died from excessive doses show a great extent of intestinal inflammation, of which the stomach, small intestines, and rectum are the chief seats; in some cases, ulceration has been observed; and, more rarely, gangrene. The fauces and windpipe are occasionally involved. The morbid appearances of other parts vary in almost every case. Small doses, long continued, accumulate in the system, and occasionally produce serious and even fatal effects. Under its prolonged use, it occasions a general sinking of the vital powers, with derangement of the digestive and nervous system; a small, quick, and sometimes irregular pulse, want of sleep, and swelling of the face and extremities. These effects, however, are only observed where the remedy has been injudiciously administered for too long a period. Of 320 cases in which this remedy was given by Dr. Fowler, no immediate operation occurred in one-third; relaxed bowels, in somewhat more than one-third; nausea, in one-third; vomiting, purging, swellings, and anorexia were comparatively rare. Mr. Hunt observes among the effects of medicinal doses—(1) an irritation of the conjunctiva; (2) swelling of the face; (3) a slight desquamation of the skin, observable only under a magnifying glass; (4) the portions of the skin protected from the access of light assume a dingy brown appearance. Sir T. Watson also mentions, amongst other symptoms, a peculiar silvery whiteness of the tongue. Salivation has also been observed in some instances; and, if the medicine be too long continued, the urine occasionally acquires a jaundiced appearance. With respect to the tolerance of this medicine acquired by habit, Dr. T. Von Tschudi states that in Austria the peasants take it in large quantities, in order to gain *embonpoint*, and to render themselves long-winded. For this purpose, they commence with about half a grain, and gradually increase the dose, until a piece of about the weight of four grains is taken. He mentions the case of one man of about 60 years of age who for more than 40 years had followed the practice. It appears to produce no ill effect so long as the drug is continued; but when the indulgence is stopped, symptoms of illness are sure to appear, which have the closest resemblance to those produced from poisoning by arsenic. The symptoms produced by excessive or poisonous doses are very various, and comprise vomiting, sometimes of blood, diarrhœa, pain, thirst, headache, cramps in legs, &c. Doubts have been entertained as to the reported arsenic eaters of Styria, but these have been dispelled by the personal observations of Dr. C. Maclagan.[1]

Dose:—Gr. $\frac{1}{60}$–gr. $\frac{1}{12}$.

Contra-indications. 1. All sthenic diseases, attended by strong arterial action; 2. Irritable states of the stomach and alimentary canal; 3. Inflammatory pulmonary affections; 4. Infancy and childhood.

[1] Edin. Med. Journ. 1864, p. 203.

369. *Rules for the Administration of Arsenic.*

1. The bowels should be well-cleared out by a purgative previous to commencing a course of arsenic.

2. It should never be taken upon an empty stomach: directly after a meal is the best time for its administration.

3. It should always be commenced in small doses, and given with the greatest regularity, at stated times.

4. During its employment the eye of the patient should be examined daily; if the eyelids and conjunctiva become inflamed, the medicine should be discontinued or suspended.

5. When the urine is high-coloured and scanty, with lithate of ammonia sediment, the tongue loaded, especially at its tip and edges, presenting a silvery appearance, the medicine generally disagrees, and aggravates the symptoms; but it is often useful, when the visceral disorders on which these symptoms depend are removed.

6. When, under its use, the urine, from being pale and copious, becomes scanty, acid, and high-coloured, the medicine should be suspended.

7. If cough and other symptoms of bronchial irritation arise during the use of the remedy, it should be omitted.

8. If there is a sensation of swelling and stiffness of the palpebræ and face; heat, tenderness, and itching of the tarsi; or tenderness of the mouth, with a silvery coating on the tongue, these may be considered as indications that the remedy has been carried as far as it can with safety.

9. During a course of arsenic, it is advisable to omit its use for a day or two, every fortnight or three weeks, and to exhibit a mild aperient, in order to prevent the remedy from accumulating in the system.

10. Any nausea or vomiting which it may occasion will be prevented by the addition of a few drops of laudanum.

11. Dr. McCall Anderson has pointed out that there is a great susceptibility to cold experienced by persons under the influence of arsenic; but doubts are expressed as to the fact by Dr. Farquharson.

12. It may be given to children, even to infants, with perfect safety, in doses of mj. of Fowler's solution for a child of a month or six weeks old. (Wilson.) They not only bear it well in full doses, but grow fat and rosy when taking it. (Dr. Pye-Smith.)

See also § 377.

370. *Therapeutic Uses. In Intermittent and Periodic Diseases,* arsenic holds a high place. It has maintained its character for centuries amongst Eastern nations; and its efficacy has been attested in England by Drs. Fowler, Arnold, Withering, Brown, and others. The Tasteless Ague Drop, so long celebrated in England, is a solution of arsenic. It ranks next in value to quinine, over which it has the advantages of being of a less disagreeable taste and of being cheaper. Sir Joseph Fayrer,[1] whilst not regarding it as equal to quinine in the early stages of malarious fever, states that in cases of chronic malarial poisoning with frequent returns of fever and neuralgia, he has seen great benefit from the continued use of arsenic: Liq. Arsenicalis gutt. iij.–iv. twice daily after food. Sir Ranald Martin speaking of the treatment of old cases of intermittents chiefly from tropical countries, in which quinine had been previously used and failed, says he often employs arsenic, and characterizes it as "indeed a noble remedy." Dr. Adamson[2] considers the powers of arsenic to be

[1] Fevers of India (Croonian Lectures, 1882), p. 114.

[2] Edin. Med. Journ. May 1862.

greatly increased by the addition of the carbonate of ammonia (gr. v. ad Liq. Arsenicalis ℥vj., Aq. f℥j.) repeated every two or three hours, according to the frequency of the paroxysms. It may either be given in substance or in the form of Liquor Arsenicalis: the dose of the former is from $\frac{1}{12}$ to $\frac{1}{8}$ of a grain; of the latter, from ij. to viij. or x. drops twice or thrice daily. When one preparation fails the other is sometimes successful, and it is often productive of the best effects when quinine has proved ineffectual. From a careful consideration of all that has been written on the subject, it may be concluded—1. That arsenic is a powerful antiperiodic. 2. That in recent and severe cases it is greatly inferior to quinia. 3. That it not unfrequently succeeds when quinia fails, and *vice versâ*. 4. That arsenic and quinia conjoined often succeed when each remedy singly has failed to produce good effects. 5. That arsenious acid in substance will sometimes succeed better than the soluble preparations. Dr. K. M. Downie[1] has adduced facts which tend to prove that arsenic is a powerful prophylactic against malarious poisoning—equal if not superior to quinine.

371. *Neuralgic and Spasmodic Diseases.* *In Neuralgia*, arsenic is often of great value and more widely applicable than quinia, proving useful both in the malarial and non-malarial types. In the former, it should be given in large doses—*e.g.*, Liq. Arsenicalis ℥x. increased to ℥xxx. thrice daily; in the latter ℥v. thrice daily, or gr. $\frac{1}{16}$ of arseniate of soda in pill, with extract of hop, will effect all the good which this medicine can produce.

372. *Asthma, Angina Pectoris, and Gastralgia*, according to Dr. Anstie,[2] are intimately allied, being neuroses of different portions of the pneumogastric, of central origin, and what lends some support to this view is the fact that there is one remedy of great efficacy in each of them—viz., arsenic. Fowler's solution, in doses of ℥v. thrice daily, affords speedy relief in many cases. It proves especially useful in Angina, and in that form of Gastralgia which accompanies asthma. Dr. Anstie lays great stress on the value of arsenic in these cases, and its efficacy has been attested by others. Dr. Hilton Fagge ("Syst." iv. p. 686) found it prevent the recurrence of those attacks of *Angina-like pain which forms so important a symptom in many cases of Aortic Regurgitation.* Prof. Gairdner (*ibid.* v. p. 597), who employed it with very decidedly good effects in Angina, regards it as specially adapted for anæmic cases, but where the anæmia is very marked, he advises its combination with iron. Dr. G. W. Balfour[3] regards arsenic indispensable in all forms of weak heart accompanied by pain: it is useful in all such cases, he says, and in many is quite successful in putting a stop to Angina—in some instances permanently; but in order to do this it requires to be given regularly (Liq. Ars. ℥iij.–v. twice a day after food) till slight physiological symptoms appear, and there-

[1] Indian Med. Journ. 1872.
[2] Brit. Med. Journ. Nov. 11, 1871.
[3] Edin. Med. Journ. March 1881.

after continued in a dose just short of that needful to produce these effects. Its action is obscure, but however it may act, Dr. Balfour adds, it is a drug well worthy of confidence in the treatment of Angina, and associated with iron and strychnia it forms a combination specially valuable *in all Cardiac Neuroses.* Of all remedies for *Gastralgia* arsenic is king, is the opinion of Dr. Clifford Allbutt;[1] and Dr. Leared[2] considers that the remarkable power arsenic possesses in curing severe forms of gastralgia constitutes one of its most valuable properties. Where it disagrees, which it rarely does if given in accordance with the above rules, it may be administered hypodermically, or by the inhalation of the smoke of arsenical cigarettes. (See SODÆ ARSENIAS.)

373. *In Hemicrania,* arsenic has often the best effect. Sir T. Watson speaks favourably of it. He believes that gutt. iv.–vj. of Liq. Arsenicalis, three or four times a day, with due attention to the state of the bowels, will be almost sure to remove hemicrania in nine cases out of ten. *In Migraine,* arsenic is favourably spoken of by Dr. Anstie.[3] It seems in some anæmic cases, he says, to act more efficiently than iron, both in improving the blood-making process, and in lessening the tendency to pain.

374. *In Chronic Rheumatism,* arsenic often proves highly serviceable. Dr. Fuller remarks that arsenic, judiciously administered, and carefully watched in its effects, is one of the most valuable remedies we possess in the chronic forms of this disease. Dr. Christison also bears witness to its efficacy; and Dr. Begbie, who entertains a high opinion of it, relates several cases illustrative of the benefit to be derived from it. Dr. Begbie regards arsenic as a special alterative in the rheumatic diathesis—a true anti-rheumatic. In *Rheumatic Gout,* so called, especially when characterized by inactivity of the skin, which is cold, harsh, and dry, arsenic is very favourably spoken of by Dr. Fuller. If the urine be turbid, he gives Liq. Arsenicalis ♏viij.–xv. with Liq. Potass. or Potass. Acet.; if the urine be clear and of a low sp. gr., he gives Liq. Arsen. Hydrochlor. ♏x.–xx. either alone or with bark; and if acids be indicated, with hydrochloric acid.

375. *In Toothache,* a minute portion of arsenic (gr. $\frac{1}{20}$) introduced into a carious tooth, is an effectual mode of destroying the exposed pulp, and thus permanently relieving the pain. It may be conjoined with a small portion of morphia, and the whole may be kept *in situ* by proper stopping. In some cases the pain is at first aggravated, but this soon ceases.

376. *In Chorea,* arsenic is a remedy of established value. Dr. Begbie, indeed, states that in an experience of over thirty years he has never known arsenic to fail; he prescribed gutt. v. Liq. Arsenicalis twice daily after a meal, and added a drop to the dose every day until the specific effects of the mineral appeared, when he suspended it for a time, and then resumed its use. Dr. Radcliffe states that though he has great faith in the efficacy of arsenic in

[1] Liverpool and Manch. Med. Reps. 1873, p. 111.

[2] Brit. Med. Journ. Dec. 28, 1878.

[3] Practitioner, Dec. 1872.

these cases, he has often had to abandon it on account of the gastric disturbance it is apt to create; but it appears probable, from some trials made with it by Dr. Radcliffe, that it may be used with a good chance of success if introduced into the system hypodermically or endermically. Dr. J. Sawyer[1] considers that the failure of arsenic in these cases is always due to its not having been given in sufficiently large doses, which he says may be safely increased far beyond the limits laid down in textbooks—*e.g.*, to a child æt. ten, he commences with ♏x. of the solution twice daily in 1 oz. of water; this he increases ♏v. every third day, until the dose reaches ♏xxxv. thrice daily—105 minims in twenty-four hours! Much more evidence than we possess at present is necessary before a prudent practitioner would be justified in adopting this heroic treatment. *In Epilepsy*, arsenic has also been employed, but the evidence of its utility is far less conclusive than that adduced in chorea.

377. *Diseases of the Skin.* It is in this class of diseases that the value of arsenic is most manifest. Amongst others who have brought it into general use is Mr. Hunt, who, after studying its remedial powers for thirty years, lays down the following excellent rules, the value of which the subsequent experience of others has tended to establish:—

Arsenic should never be commenced while signs of active cutaneous inflammation are present.

It should be well mixed with the food or drink, and never taken on an empty stomach.

It should be given in three or four doses daily, and with the greatest regularity.

Five minims of Liq. Arsenicalis is generally a sufficient dose to commence with—*i.e.* ♏xv. daily. As soon as the conjunctiva becomes affected, this dose may be reduced; but it is desirable to reduce it gradually. Dr. Farquharson[2] objects to this mode of administration, and as a rule prefers to commence with ♏x. of Liq. Arsenicalis, and pushing boldly up to ♏xv. or ♏xx., and in this way he states he has obtained very satisfactory results with little trouble from the patient's inability to continue the drug. He also protests against the alleged necessity for the production of the physiological effects of the drug before it begins to act efficiently as a curative agent. This is contrary to his own experience.

During the administration of the minimum dose, should conjunctivitis supervene, the dose should be further reduced; if necessary, it may be wholly discontinued for a very short period.

The minimum dose (*i.e.*, a dose which, if given continuously, affects the conjunctiva in the slightest possible degree) should be persevered in with unremitting regularity for as many months after the disappearance of the disease as it had previously existed years. This is necessary to prevent a relapse.

Should the disease appear to advance instead of recede during any period of the minimum dose, the course should not be inter-

[1] Brit. Med. Journ. Dec. 23, 1882. [2] Brit. Med. Journ. May 29, 1880.

mitted on this account. Leeches or purgatives in the sthenic, and quinine with generous living in the asthenic cases, will generally be sufficient.

In order to test more strictly the value of the remedy, Mr. Hunt occasionally intermitted the course, and with the most uniform result—viz., a relapse of the disease. For the same purpose, he abstained from all external applications (leeches excepted), and states that he never found them necessary to the cure.

378. Dr. T. M'Call Anderson, in advocating the use of arsenic in *Eczema*, recommends that it be given in doses of ♏v. of Liq. Arsenic. thrice daily, and at the end of a week or so the dose is to be increased by a drop every second or third day. He does not think it necessary to stop if irritation of the eyes or slight puffiness of the face is induced. If these symptoms, however, become aggravated, and are accompanied by pains in the stomach and head, anorexia and nausea, the dose should be diminished, or omitted for a few days. But he recommends that its administration be not stopped altogether because these physiological effects are produced. In the case of infants at the breast he prescribes arsenic for the mother. Administered in the manner above indicated, arsenic has been found to exercise a more or less powerful influence in *Lepra*, *Psoriasis*, *Eczema*, *Impetigo*, *Acne punctata* and *rosacea*, *Prurigo*, *Pruritus ani*, *Pemphigus*, *Lichen*, *Sycosis*, *Urticaria*, *Chloasma*, and *Alopecia*. Local applications should not be neglected, and require to be varied according to circumstances.

379. *In the Eczema of Children*, Sir E. Wilson[1] speaks in the highest terms of arsenic, especially in combination with iron, thus: ℞ Liq. Arsenicalis ʒj., Vin. Ferri ʒiss., Syrup. ʒiij., Aq. Anethi ʒij. M.: dose, ʒj. with meals, thrice daily, to be stopped immediately if it disagrees. Bowels to be carefully regulated, and benzoated zinc ointment to be applied locally. Dr. Pye-Smith likewise also testifies to its great value in chronic cases, especially when the eruption is not pustular, and when widely distributed. Here, he says, it is almost always necessary, and rarely fails of success.

380. *To Warts and Corns*, Liq. Arsenicalis is a useful local application, sometimes causing their dispersion, and given internally it has been found of service in cases of *Furunculus*. *In Onychia Maligna*, Mr. Luke regarded an arsenical ointment (Arsenious Acid, gr. ij., Lard ʒj.) as almost a specific. (Pereira.)

381. *In Lupus of the head and face*, Mr. Milton regards arsenic as the best remedy. After correcting any disorder of the digestive or general system, should occasion require, he commences its use in doses of ♏xij. of Liq. Arsenici Hydrochlor. thrice daily, increasing the dose until its full physiological effects are developed. He reports highly of its efficacy: not so Billroth (ii. p. 145).

382. *In Elephantiasis Græcorum*, arsenic has for centuries been held in high esteem in India. M. Benet, formerly physician to the King of Lahore, states that he has in numerous instances seen the

[1] Brit. Med. Journ. April 1, 1871.

following formula prove very efficacious:—105 grains of arsenious acid are triturated with five or six times the quantity of black pepper. This is made into a mass, and a pill the size of a "tare" is taken night and morning. This is the celebrated "Tanjore pill," and by the native practitioners of India is regarded as almost certain cure.

383. *In Framboesia, or Yaws*, I have seen great amelioration follow a prolonged course of Liq. Arsenicalis, in doses of gutt. iv.–v., gradually increased to gutt. viij. thrice daily. Many cases, however, resist this as well as all other treatment.

384. *In Cancer*, arsenic was formerly regarded almost as a specific, and though much reliance is not to be placed on it, the symptoms sometimes are said to improve under its use. (See § 385.) As a local application, arsenical paste at one time enjoyed high repute, but deaths having been reported to have been caused by its absorption into the system, it has fallen into disrepute. It is said that weak preparations alone are dangerous, that only these become absorbed and produce poisonous effects, while strong arsenical preparations are rendered safe by their causing so much local inflammation that the action of the absorbents are paralyzed or suspended *pro tem.*; hence the resulting action of the caustic is rendered purely local. This is not always the case, however: death has followed the application to a cancer of a plaster containing one-half its weight of arsenic.[1] It is not as if arsenic were the only caustic, or if it possessed any special beneficial action, which it has not, and whilst we have chloride of zinc, Vienna paste, &c., it seems unjustifiable to introduce any unnecessary element of danger in the treatment of cancerous or other disease.

385. *Uterine Affections.* *In Carcinoma of the Uterus, in Irritable Uterus*, and in several cases of *Menorrhagia*, arsenic has been used with decided benefit by Mr. Hunt,[2] of Dartmouth, who advises it, in doses of gr. $\frac{1}{20}$ thrice daily, immediately after meals. *In Cancer of the Uterus*, Dr. Atlee, of Philadelphia, has much faith in a long course of small doses of arsenic internally, with the application of a strong solution of iodine in glycerine locally. *In Chronic subacute Uterine Inflammation*, with marked tendency to relapses, Dr. Tilt states that he has given arsenic with good result.

386. *In Menorrhagia, Leucorrhœa*, and *Uterine Hœmorrhage in threatened Abortion and after Delivery*, Dr. A. Burns speaks of arsenic as a most reliable remedy. He prescribes in hæmorrhage, at first ♏x.–xx. of Fowler's Solution, according to the severity of the case, and repeats ♏x. every fifteen or twenty minutes till the discharge ceases. In Leucorrhœa he gives ♏v. thrice daily till a cure is effected. Dr. J. H. Aveling[3] considers that the forms of Menorrhagia and Leucorrhœa most amenable to the arsenic treatment are those which have their origin in a hyperæmic condition of the uterus, which state the remedy cures by acting as a tonic

[1] Glasgow Med. Journ. 1869.
[2] Med.-Chir. Trans. vol. xxi.
[3] Lancet, Aug. 12, 1871.

and stimulant upon the vaso-motor nerves, causing the capillaries to contract and expel the superabundant blood.

387. *In Phthisis*, arsenious fumigation by means of cigarettes has been advocated by Trousseau and others, but they are of doubtful utility, and should only be used with the greatest caution. In nine cases it was tried internally by Dr. Leared, who considers that it would prove useful in virtue of its action on the respiratory system, as well as by its tonic properties, but that it is ill borne by the digestive system even when combined with sedatives. This remark applies equally to *Chronic Bronchitis*, in which it has been occasionally found serviceable when copious expectoration and much emaciation are present. It is very favourably reported of by Dr. Thorowgood, who has derived great benefit from it; at times, indeed, he states it will act quite like a specific in improving the breathing. He mentions a case of three months' standing cured by Liq. Arsenicalis (ℳij.) in alkaline infusion of calumba thrice daily. *In Chronic Coryza* it may also often be given with great advantage.

388. *In Plethora*, with determination of blood to the head, arsenic is reported to have been used with great advantage. *In Apoplectic Congestions*, the use of arsenic is advocated by Dr. Lamaire Piquot, who considers that it acts by reducing in a remarkable manner the excess of the red globules of the blood, which in these cases he supposes to exist in a morbid and dangerous degree. Its use is limited to strong plethoric subjects, and is not applicable to old weakly subjects when there is a disposition to apoplectic congestion. He prescribes arsenious acid in doses of gr. $\frac{1}{15}$–gr. $\frac{1}{6}$ in a f℥iv. mixture daily, one-half at each meal. In one case of this description, I witnessed more relief from the use of Liq. Arsenicalis, in combination with Liq. Potassæ, than from the local abstraction of blood, blisters, and setons.

389. *Anæmia.* According to Dr. S. Coupland,[1] next to iron, and in some forms of anæmia to be preferred to it, is arsenic. It is, he observes, a powerful hæmatinic, and acts on the tissues as well as on the blood and blood-forming organs. It is almost the only drug, in his opinion, which has been successful in the treatment of *severe idiopathic anæmia*, which so often resists all medication. In simple anæmia he prefers iron. A case of *Progressive pernicious Anæmia* is recorded by Dr. Byron Bramwell,[2] in which Liq. Arsenicalis succeeded after iron, cod-liver oil, &c., had failed. Dr. Stewart Lockie[3] also testifies to its value in this class of cases. He regards it as a valuable cardiac tonic. Dr. Padley[4] corroborates these remarks with regard to *Idiopathic Anæmia.*

390. *In Albuminuria*, arsenic appears worthy of more attention than has hitherto been paid to it. Dr. Brunton[5] relates an interesting case in which, under the use of Fowler's Solution (ℳiij. at mealtimes), the albumen disappeared almost at once from the

1 Brit. Med. Journ. April 23, 1881.
2 Med. Times, Sept. 1877.
3 Brit. Med. Journ. Dec. 7, 1878.
4 Lancet, 1883, vol. ii.
5 Practitioner, June 1877.

urine; it reappeared when the remedy was discontinued, but it was arrested a second time by the same means. Dr. Phillips (p. 461) states that he has for years used this solution in *Scarlatinal Albuminuria*, that it removes the dry inactive condition of the skin, checks thirst, and causes a copious flow of urine, which gradually becomes less loaded with albumen; should dyspnœa be present, the remedy quickly relieves it, and œdema of the face and body disappears. He adds that he has also used the solution with excellent results in numerous cases of *temporary or intermittent albuminous urine dependent on imperfect digestion.*

391. *In Diabetes Mellitus*, arsenic has been administered with varying results—sometimes having been of no service, at other times having been supposed to have effected cures. In cases depending upon imperfect formation of glycogen in the liver, it can hardly be expected to be useful, and it is possible that the different results obtained depend in some cases upon deficient, and in others upon imperfect glycogenic function of the liver. It should be given in doses of from three to thirty (?) drops of Fowler's Solution thrice daily, but care must be taken not to push it so as to interfere with the digestion. (Dr. Lauder Brunton, v. p. 423.)

392. *Gastrodynia*, especially when partaking of a neuralgic character, is often signally benefited by arsenic. If the pain be violent, and if it come on generally when the stomach is empty, the remedy will, according to Dr. Leared,[1] almost to a certainty succeed.

393. *In many forms of Chronic Dyspepsia, Chronic Diarrhœa, Ulceration of the Stomach, Heartburn, &c.*, arsenic is highly spoken of by Dr. Ringer (p. 300). He gives Liq. Arsenicalis ♏j.–ij. shortly before each meal. He also speaks of it as very effectual in checking the morning *Vomiting of Drunkards.*

394. *In Hay Fever*, Dr. Mackenzie states that he has seen arsenic most serviceable, particularly when it partakes more of a catarrhal than an asthmatic character. Where the disease has been slight, or the medicine has been given with a view of improving the tone of the mucous membrane, rather than of correcting morbid action, doses of ♏iij. of Liq. Arsenicalis, or even less, are preferable; whilst, on the other hand, if the irritation has been excessive, or resists these, larger doses may be given, and their action modified or assisted, in different cases, by remedies of a kindred character. He likewise found it useful in obstinate *ordinary Catarrh*, in the absence of all febrile or inflammatory action.

395. *In Catarrhal Ophthalmia*, and more especially in those forms which are of a passive, subacute, or chronic character, or where the irritability of the conjunctiva is excessive, arsenic has proved very beneficial in the hands of Dr. Mackenzie. In *Strumous Ophthalmia*, Dr. Thorp states that arsenic is a most valuable agent in inveterate cases, more especially when complicated with chronic eruptions of the scalp or cutaneous surface generally. Mr. Brudenell Carter[2] bears testimony to its value in these cases, having found superficial *Corneal and Conjunctival Eruptions* and *Ulcerations*,

[1] Braithwaite's Retrosp. lvii. p. 92, 1868. [2] St. George's Hosp. Reps. 1875.

which, with attendant *Photophobia*, were collectively described by old writers as "*Strumous Ophthalmia*," yield almost immediately to its administration.

396. Liquor Arsenicalis. Liquor Potassæ Arsenitis (Ph. Lond.). Fowler's Solution.

Med. Prop. and Action. Similar to those of Arsenious Acid (*q.v.*). It occasionally, however, succeeds when the acid fails, and *vice versâ*. It is the form of arsenic best adapted for children, when it is considered advisable to administer so powerful a medicine; fl. oz. j. contains gr. iv. of arsenious acid, and fl. drm. j. gr. $\frac{1}{2}$.

Dose:—mij.–v.–viij. twice or thrice daily.

397. *Therapeutic Uses.* Professor Köbner[1] reports a case which still further confirms the value of Fowler's solution of arsenic in *cutaneous diseases*. Two years previously, the patient, who was eight and a half years old and had always been delicate, developed *sarcomatosis of the skin*, which gradually spread until almost the whole cutaneous surface was affected. Köbner commenced injecting Fowler's solution in distilled water, in proportions of one to two, from two and a half to four drops of the arsenical solution being used at each injection, thrown under the skin or into the muscular tissue of the gluteal region, and into the stroma of some of the larger tumours. In three months five injections were made, ʒij. of Fowler's solution being used. At the end of three months the tumours were considerably diminished, having disappeared in some places, leaving a brownish cicatrix. Equal parts of the arsenic solution and distilled water were then used, six to nine drops being injected in about forty days, ʒiv. of Fowler's solution being used, with progressive amelioration of the symptoms, the lymphatic glands being greatly reduced in size, and the liver and spleen reduced to their normal diameter. The quantity injected was then gradually reduced, and in one year from the commencement of the treatment nothing was left of the disease except a few cicatrices, showing the former position of some of the larger tumours. See also Acidum Arseniosum.

398. Liquor Arsenici Hydrochloricus. Hydrochloric Solution of Arsenic. Valangin's Solution.

Med. Prop. and Action. Similar to those of Liq. Arsenicalis (*q.v.*), but is thought to cause less gastric irritation.

399. Liquor Arsenici et Hydrargyri Iodidi. Solution of the Iodide of Arsenic and of Mercury. Commonly known as Donovan's solution. Each fluid drachm of the solution contains a quantity of teroxide of arsenic equivalent to gr. $\frac{1}{12}$ of arsenious acid, and of iodide of mercury, equivalent to gr. $\frac{1}{4}$ of the peroxide of mercury, and gr. $\frac{3}{4}$ of iodine, converted into hydriodic acid.

[1] Gaz. degli Ospatili, May 1883.

Med. Prop. and Action. Alterative in doses of ♏xxx. thrice daily. Sir E. Wilson (p. 281) regards this dose as too large, in many cases giving rise to headache, nausea, and occasionally salivation; but these symptoms disappear when the medicine is discontinued. It is a very valuable preparation.

400. *Therapeutic Uses. In obstinate Cutaneous Diseases*, particularly in *Psoriasis, Lepra, Pityriasis, Ephelis, Lupus*, and *Impetigo*, the solution has been found highly successful. Dr. Osbrey advises the following formula: ℞ Liq. Ars. et Hyd. Iod. gutt. lxxx., Aq. Dest. f℥viij., Syr. Zingib. f℥ss. M. Dose, f℥j. every third hour. *In Sycosis* it has been found highly useful by Sir E. Wilson (p. 418.) *In Urticaria*, Dr. Osbrey found the solution in doses of gutt. vj. thrice daily, productive of signal benefit. *In Cancer*, Dr. Tilt (p. 245) thinks that this solution (♏xxx. thrice daily) should have a fair trial. According to Hill and Cooper (p. 430) it is sometimes very effective in dispersing obstinate *Scaly Syphilides*, and also in the late *Syphilitic Affections of the Tongue.*

401. Assafœtida.

Med. Prop. and Action. Stimulant, antispasmodic, expectorant, and anthelmintic. It is the most active and powerful of all the fetid gums. When taken internally, it is absorbed into the system, and communicates its odour to the urine, milk and perspiration, and fæces. It may also be detected in the breath. The Arabians place it among their aphrodisiacs, and throughout the East it is considered to be of so stimulating a nature that if administered to a pregnant woman it will cause the death of the fœtus. Recent observations in Europe partially support this opinion. Lombard, however, regards it as a sedative; he found it diminish and render more regular the movements of the heart, and produce a state of tranquillity not easily excited. It is best administered in the form of tincture. It occasionally enters into the composition of enemas.

Dose:—Of Assafœtida, gr. v.–xx. in pill or emulsion. *Of the Compound Pill* (Assafœtida, Galbanum, Myrrh āā ʒij., Treacle ʒj.), gr. v.–x. *Of the Tincture* (Assafœtida ʒijss, Rect. Spirit Oj.), fl. ʒss.–j. It may also be used in the form of *Enema* (Assafœtida gr. xxx., Water ℥iv.).

402. *Therapeutic Uses. In Spasmodic Asthma*, assafœtida is sometimes very beneficial. It is best given in combination with other antispasmodics and with narcotics, thus:—℞ T. Assafœt. fl. ʒss. T. Opii ♏xx., Spt. Æther. Sulph. Co. fl. ʒss., Mist. Camph. fl. ℥jss., M. ft. haust. *The Dyspnœa of Chronic Bronchitis*, especially in the aged, is often manifestly benefited by this or a similar formula. *In the advanced stages of Pneumonia and Bronchitis in Children*, it is spoken of by Dr. G. B. Wood (i. p. 612) as an admirable remedy, but its nauseous taste and smell are great objections to its use. In all these cases it acts by allaying spasm and facilitating expectoration.

403. *In Flatulence and Flatulent Colic*, especially in that occurring in hysterical women, an assafœtida enema often affords immediate relief. *The Tympanitis of Fever* is also often relieved by the same means. In the former cases, the compound pill, in combination

with Pil. Rhei Co. and Ext. Hyoscyami, is often productive of good effects.

404. *In Hysteria*, assafœtida is one of the most useful medicines which we possess. Its operation is generally speedy, uniform, and permanent. Its use is not confined to one form more than another, although its effects are more readily evidenced in persons of weak and debilitated constitutions than in the stout and robust. The following is a popular form for its administration:—℞ T. Assafœtid., T. Castorei, T. Valerian Am. āā fl. ʒij., Mist. Camph. fl. ʒvij. M. Dose one or two tablespoonfuls every hour. It may also be used in the form of enema.

405. *In Dyspepsia, attended with Hypochondriasis and other Nervous Affections*, assafœtida, in combination with bitter tonics and mild aperients, may often be given with advantage. In these cases, it is best given in the form of compound pill.

406. *In Nervous Affections connected with Uterine Derangement*, it is also a remedy of much value. When it is desired to produce a speedy and decided effect, the tincture should be given: but its effects are more permanent if administered in substance. Dr. Pollock relates a case of *Epilepsy* in which he employed, with the most satisfactory results, a combination of Tinct. Assafœtid. (ℳxxx.) and Carb. Ammonia gr. iij. thrice daily.

407. *In the Convulsions of Childhood during Dentition*, an enema containing a small portion of assafœtida appears to mitigate the severity and the duration of the convulsion.

408. *Against Lumbrici or Round Worms*, Dr. Cazin regards assafœtida as a valuable vermifuge, particularly when the presence of intestinal worms gives rise to sympathetic nervous affections. It thus fulfils a twofold indication. He mentions two cases of *Chorea* and one of *Epilepsy* in which assafœtida not only revealed the true cause (*Lumbrici*), but effected a cure.

409. Atropa Belladonna, *Linn.* Belladonna. Deadly Nightshade.

Med. Prop. and Action. The leaves and root (*off.*) are anodyne and antispasmodic, their activity residing chiefly in an alkaloid, *Atropia* (*q.v.*), and partly in another principle, *Belladonnine*, first described by Lubekind. The physiological effects of Atropia have been carefully examined by Dr. Harley and others, and it may be premised that a similar train of symptoms follows the exhibition of the alkaloid, or of belladonna in substance, whether introduced into the system hypodermically or by the alimentary canal, and that $\frac{1}{50}$th gr. of the alkaloid is sufficient to produce the full effects of the plant. The following are the effects of a full medicinal dose:—Acceleration of the pulse from 20 to 70 beats, with a slight increase of its volume, and a considerable increase in the force of the cardiac and arterial contraction, a general diffusion of warmth throughout the cutaneous surface; a gentle throbbing or heaving sensation in the carotid; a slight feeling of pressure under the parietal bones; giddiness, heaviness, and drowsiness, or actual somnolency, accompanied by a tendency to quiet dreamy delirium and nervous startings; complete dryness of the tongue, roof of the mouth, and soft palate, extending more or less down the pharynx and larynx, rendering the voice husky, and often inducing dry cough and difficulty of deglutition; a parched condition of the lips; occasional dryness of the

Schneiderian and conjunctival mucous membranes, and increasing dilatation of the pupils. After continuing about two hours, the dryness of the mouth suddenly gives way to a viscid, sticky, acid secretion, of a peculiar and very sickly offensive odour; and the mouth becomes foul and clammy, and the tongue usually covered with a white fur. A short time before moisture returns to the mouth, the pulse is observed to fall, and it now rapidly resumes its ordinary rate and character. The pupils have now reached the maximum degree of dilatation; but they will still contract to a fourth, sixth, or even eighth of an inch, varying according to the original dimensions of the pupil when exposed to the brightest light.

During the action of the medicine there is observable a slight elevation of the temperature of the surface, rarely exceeding one degree; and a still slighter and less appreciable rise of the internal temperature of the body. No difference has been observed in the rate of respiration, except such as may happen in a nervous woman, a little emotional excitement on the sudden accession of the giddiness. The breathing remains as tranquil as before the injection. The patient occasionally heaves a deep sigh, or more frequently gives a prolonged yawn, as he sits still in a dull, apathetic, or drowsy condition.

After the pulse has resumed its ordinary rate, and the mouth has moistened, the giddiness and drowsiness pass off, and the patient appears tolerably lively and brisk in mind and body; but he may continue to feel, for some hours longer, such languor of body and mind as will render him incapable of active bodily or mental exertion. A little dimness of vision may also remain, and occasionally there is so much that the patient is unable to thread a needle, or even to read.

Headache, either during the action of the medicine or afterwards, is a rare and exceptional occurrence. The desire for food returns soon after the operation of the medicine; but, during its action insalivation and deglutition are almost, if not quite, impossible.

If a larger dose than is sufficient to produce the above symptoms be given, there is superadded a fluttering sensation in the cardiac region; slight delirium, manifested by picking and other motions of the hands and fingers in the air, as if they were in contact with real objects; muttering and smiling; staggering, or complete inability to walk.

Atropia is rapidly eliminated by the kidneys, in whatever way it is introduced into the system, appearing in the urine in less than twenty minutes after the injection of even the $\frac{1}{96}$th of a grain. The fact is easily demonstrated by dropping into the eye, at intervals of 10 or 20 minutes, for two or three hours, one or two drops of the urine. That the $\frac{1}{96}$th of a grain of atropia may be detected in the urine is a fact of considerable importance in a medico-legal point of view. In ten patients the urine secreted immediately before and during the operation of the medicine was analysed. The result was uniform. During the action of the belladonna the urea and the sulphates and phosphates were increased; and, as a rule, the chlorine was proportionately diminished. The increase of the urea was disproportionate to, and considerably less than, that of the phosphates and sulphates. Hence, as Dr. Harley observes, atropia is, in the true sense of the word, a diuretic, and a more powerful one, probably, than any other we possess.

Certain conditions modify or interfere with the action of belladonna.

1. Children are remarkably insusceptible to the action of belladonna. They occasionally bear very large doses before dryness of the mouth or cerebral effects of any kind are produced; but the stimulant effect upon the heart and the dilatation of the pupil are as readily induced in young people as in adults and old people.

2. Amongst adults of apparently equal vigour, some are more susceptible to its action than others; and the $\frac{1}{96}$th of a grain will sometimes produce as much effect upon one individual as double that quantity upon another.

3. The influence of pregnancy is doubtful.

4. The fixed alkalies, as Dr. Garrod has observed, by decomposing the active principle, annul the operation of belladonna. This, however, only

occurs after a time; for, if the caustic alkali was mixed with the belladonna or atropia only a few minutes before it was administered, it in no way interfered with its action. Further, caustic ammonia and lime-water have the same destructive action upon atropia; and the latter, used in large quantities, promises to be the appropriate antidote in cases of belladonna poisoning.

Mr. Hughes,[1] in an able paper on belladonna, shows that its chief physiological effects and therapeutic uses as an internal remedy, depend upon the influence it exercises on the pneumogastric nerve.

Ringer[2] thus summarizes the action of belladonna:—

1. It tetanizes the cord and heightens its reflex functions.
2. It stimulates the respiratory centre and the inhibitory centre of the heart.
3. It stimulates the cardiac accelerator nerve or its centre.
4. It stimulates the vaso-motor centre, and so heightens arterial pressure.
5. It paralyses the motor nerves and those of the trunk first.
6. It paralyses the terminations of the vagi nerves both in the heart and the lungs.
7. It paralyses the terminations of the secretory nerves of the salivary glands, and perhaps those of the sweat glands.
8. It paralyses the terminations of the inhibitory fibres of the splanchnics.
9. Large doses slightly depress the functions of the afferent nerves.
10. It paralyses the terminations of the oculo-motor nerves, and stimulates the sympathetic as far as the iris is concerned.

In Poisoning by Belladonna, pilocarpine appears to act as a direct antidote, according to Mr. N. Grattan,[3] who in one such case injected hypodermically gr. $\frac{1}{5}$th of this alkaloid every fifteen minutes, till $\frac{4}{5}$ths of a grain had been administered. The patient recovered.

The alleged antagonism of belladonna and opium will be considered in art. Opium.

Dose:—Of the Powdered Leaves, gr. ½–gr. j. (a bad form of administration). *Of the Extract*, gr. ¼–gr. j. *Of the Tincture* (℥j. of powdered leaves, Proof Sp. Oj.), ♏v.–xx. *For External use only: Liniment*, Belladonna (Root ℥xx., Camphor ℥j., Rect. Spirit ad Oj.); *Ointment* (Ext. of Belladonna, gr. lxxx., Lard ℥j.); *Plaster* (Ext. of Belladonna, Resin Plaster āā ℥iij., Rect. Spirit, fl. ℥vj.)

The power of Belladonna to cause dilatation of the pupil, which renders it so peculiarly valuable in some diseases of the eye and in ophthalmic surgery, has been variously explained. Dr. Harley ascribes it to a paralyzing action on the ciliary branches of the third pair of nerves, while Dr. B. Bell considers that it depends upon a contraction of the radiating fibres of the iris. Mr. Wharton Jones regards it as due to a temporary diminution of the general sensibility of the retina conferred by the fifth pair of nerves; and Dr. A. Fleming supposes that it acts by causing a contraction of the ciliary arteries, and preventing the turgescence of the iris with blood, while the radiating fibres are drawn into action by functional sympathy with the contracted arteries. (Stillé.) Dilatation of the pupil equally occurs if belladonna be applied locally to the eye or be taken internally, but in the latter case the process is much lengthened, and the effect attended with more or less constitutional derangement. By long-continued use, it does not generally lose this property; thus, Sir W. Lawrence mentions two patients of his own, one of whom used it habitually for four or five years, and the other for fourteen or fifteen years, and it dilated the pupil just as well at the end of these periods as it did at the commencement. Occasionally, however, it loses its dilating power, but regains it if the application be suspended for a week or two and then resumed. In some rare cases the local application of belladonna to the eye produces a peculiar state termed microscopia, or micropia, in which all

[1] Brit. Med. Journ. May 20, 1860.
[2] Handbk. Therap. 9th ed. p. 558.
[3] Lancet, June 11, 1881.

objects appear much smaller than natural; it passes off, however, when the medicine is discontinued.

Remarks on its Use.—An easy test of the activity of the extract (one of the best forms for internal use) is to rub a grain or two on the eyelids; if good, it produces full dilatation of the pupil in the course of a few minutes.

2. Commence with small doses generally, and gradually increase them till it produces its physiological effects, dryness of the throat, vertigo, &c., and then diminish the dose or discontinue it altogether.

3. If on the appearance of its physiological effects, the disease for which it has been administered does not yield, its continued employment will be useless, perhaps injurious.

4. The full effects of belladonna can be more speedily (and equally safely) induced by the hypodermic injection of atropia, than by the internal administration of belladonna. (*Vide* ATROPIA.)

410. *Therapeutic Uses. Spasmodic and Nervous Diseases. In Spasmodic Asthma*, belladonna is productive of much benefit, but in order to obtain its full effects it should be given in the manner advised by Dr. Hyde Salter. He directs one full dose, sufficiently large to produce the full physiological effect of the drug, to be given every night at bedtime. This treatment is curative as well as prophylactic, breaking through the habit which in diseases of this class is most important. Dr. Anstie obtained excellent results in a case of spasmodic asthma by the hypodermic injection of atropia. According to Dr. G. Oliver,[1] injections of the sulphate of atropia (gr. $\frac{1}{100}$) and acetate of morphia (gr. $\frac{1}{3}$), combined, prove more effectual in affording relief than either atropia or morphia employed singly. In other forms of *Spasmodic and Nervous Cough*, belladonna likewise proves very serviceable, both administered internally, and applied externally in the form of plaster to the chest.

411. *In Hooping-cough*, the value of belladonna is well established. Small doses given at first may be rapidly increased, as children tolerate this drug well. Dr. Wiglesworth[2] has successfully employed Atropiæ Sulph. internally in these cases, commencing with gr. $\frac{1}{120}$ in ʒj. of water for children from $1\frac{3}{4}$ to 4 years old, once a day, either diminishing or increasing the dose as occasion dictates; when the nightly paroxysms are very severe, he repeats half the dose an hour before bedtime. Frictions of belladonna liniment to the spine may also be used with advantage in these cases. *In Laryngismus Stridulus*, it promises to be a remedy of considerable value; it seems well worthy of attention in these cases.

412. In *Epilepsy*, Trousseau recommended its use but it is now replaced in favour by the bromides.

413. *In Tetanus*, belladonna was successfully employed in several cases by Dr. Hutchinson. Another case cured by atropia (gr. $\frac{1}{60}$th every three hours) is related by Dr. G. Oliver;[3] belladonna liniment was also rubbed over the spine and rigid muscles every six hours. The patient was kept under its influence for three weeks, and then completely recovered. A case is related by Dr. D. H. Cullimore,[4] in which the hypodermic injection of atropia gr. $\frac{1}{60}$th three times

[1] Practitioner, Feb. 1876.
[2] Lancet, April 12, 1879.
[3] Practitioner, Dec. 1868.
[4] Lancet July 12, 1879.

daily manifestly controlled the spasms. During nine days two grains of atropia were injected without producing dilatation of the pupil or other physiological action, with the exception of drowsiness and slight heat of skin. It probably acts in these cases in the manner pointed out by Brown-Séquard, by reducing congestion of the blood-vessels of the spinal cord and its membranes.

414. *In Sciatica, Tic Douloureux, and other Neuralgic Affections*, belladonna takes the first rank in the list of sedatives and anodynes, both as an external and internal remedy; but, like all other remedies of this class, it occasionally fails to afford any relief. Dr. Fuller (p. 457) considers it especially adapted for the cases which are marked by spasmodic twitchings of the muscles, whether manifested by cramp or by starting of the limb; and in these cases he advises the extract in doses of $\frac{1}{4}$–$\frac{1}{3}$ or even $\frac{2}{3}$ gr. two or three times daily. Its action should be carefully watched, and it should be discontinued when dilatation of the pupil, headache, and other constitutional effects manifest themselves. As a local application he recommends the following:—℞ Ext. Belladon. ʒj., T. Opii ʒj., Glycerini ʒiij. M. A piece of lint wetted with this mixture, and covered with oiled silk, often affords very great relief when placed along the course of the nerve. When the neuralgia is superficial, Trousseau found belladonna, or a compress saturated with a solution of atropia (gr. v., Aq. fl. ʒiij.) effectual, but in cases of any severity all other plans are inferior in efficiency to the subcutaneous injection of atropia. Dr. Anstie speaks in the highest terms of the last-named treatment, especially in cases where morphia similarly employed had previously failed. *For every kind of pain in the Pelvic Viscera*, atropia in this form is, according to Dr. Anstie, incomparably the best of all remedies. It is also effectual in relieving the *Intercostal Neuralgia attendant on Herpes Zoster*. For dose, &c., see ATROPIA.

415. *In the Profuse Sweat of Phthisis*, belladonna is pronounced by Dr. Milner Fothergill[1] to be unquestionably the most potent agent we possess. For our knowledge of its use in this character we are indebted to Dr. Ringer, and its powers have been fully established by Dr. W. Murrell,[2] Dr. Williamson,[3] and others. The commencing dose, in pill, solution, or granules, is gr. $\frac{1}{120}$, increased gradually to gr. $\frac{1}{25}$. Even under the latter dose the patients complain only of some dryness of the throat and a little indistinctness of vision. (Fothergill.) The best form is perhaps hypodermic injection, gr. $\frac{1}{200}$ to gr. $\frac{1}{100}$ in solution. According to Dr. Murrell, age, sex, and temperament in no way influence the result; neither does the presence or absence of fever on the one hand, or of debility on the other. The fact of the perspiration having or not having commenced at the time of the injection is of no importance. In a case in which the patient was perspiring very profusely over the whole body, an injection was given; in five minutes the perspiration was very much less, and at the end of half an hour his skin was quite

[1] Practitioner, Dec. 1876.
[2] Practitioner, Aug. 1879.
[3] Lancet, July 26, 1874.

dry. The benefit derived from the injection lasts in most cases for several nights, so that it need not be repeated every day. An injection once in seven or ten days will often suffice to keep the perspiration in check. It is not essential to give it at bedtime; in fact, the earlier in the day it is given the more likely is it to prove successful. Where it does not completely arrest the sweating, it checks it to such an extent as to render further treatment unnecessary. It may perhaps be a question whether the sudden and complete arrest of these sweats is an unmitigated good. Atropia will stop other forms of sweating—*e.g.*, the *Sweating of Acute Rheumatism, of prolonged Suppuration, of Convalescence*, &c. (Dr. Murrell.)

416. *In Acute Rheumatism* (*Rheumatic Fever*), Dr. Harley states that he has employed belladonna with marked success. He injects gr. $\frac{1}{50}$—$\frac{1}{40}$ of the sulphate of atropia into the integument over the affected joint, as soon as the first indication of inflammatory action arises in the part. The anodyne action, he remarks, is so direct, speedy, and enduring, that the use of opium is rendered altogether unnecessary. Dr. Sibson ("Syst." iv. p. 430) observes that absolute rest and the soothing application of belladonna and chloroform liniment sprinkled on cotton-wool to the affected joints, supported by flannel so as to maintain uniform pressure, are the most important measures in the treatment of acute rheumatism for the prevention of pericarditis; to be strictly maintained for several days after the subsidence of the local inflammation. The liniment is favourably spoken of by Dr. Southey.

417. *In all conditions and diseases in which there is depression of the sympathetic influence, such as Syncope from Asthenia or shock, or the collapse of Cholera, in failure of the heart's action from Chloroform, or other cardiac paralysers*, the subcutaneous use of sulphate of atropia in doses of gr. $\frac{1}{100}$—$\frac{1}{40}$, is, according to Dr. Harley, the appropriate and most hopeful means of resuscitation. He considers that it should stand at the head of our stimulants, for there is no medicine in the Materia Medica, he adds, which at all approaches belladonna in its simple, direct, immediate, and powerful influence in exalting the force and rapidity of the heart's action. The observations of Prof. Fraser, Dr. Milner Fothergill, Dr. H. C. Wood, and others, tend to confirm Dr. Harley's views, and to show that in belladonna we possess a powerful and valuable cardiac stimulant.

418. *External or Local Inflammations. In Acute Inflammation of the Mamma*, Mr. C. Heath[1] found great benefit from the extract applied to the inflamed surface, leaving the areola and nipple untouched in order that the infant might be able to suck with safety. He also speaks very favourably of it as a local application in *Inflammatory Swelling of the Lymphatic Glands of the Neck, in Inflammation of the Lower Jaw depending upon alveolar abscess, in Painful Lymphatic Affections, in Sympathetic Buboes, and in the earlier or inflammatory stages of Boils and Carbuncles*. In these

[1] Practitioner, Nov. 1868.

cases, the extract, softened with glycerine, should be freely applied over the affected surface, and occasionally, when the pain is very severe, a poultice may be placed over the extract for a few hours only. *To Mammary Glandular Indurations*, Sir James Paget[1] advises the application of a belladonna plaster. He does not suppose that it has any direct medicinal value, but it may alleviate pain and protect the part from being constantly touched or handled. Internally he gives at the same time Liq. Potassæ (*q.v.*).

419. *Diseases of the Eye.* Belladonna, from its property of dilating the pupil, is a valuable agent in the treatment of diseases of the eye and in ophthalmic surgery It assists materially in allowing the surgeon a fuller view of the disease, thereby affording further scope for his manipulations. Dilatation of the pupil by its means is a necessary preliminary to examination with the ophthalmoscope. It is almost impossible to exaggerate the value of belladonna and its alkaloid in ophthalmic medicine and surgery, but to obtain the maximum of good from it, discrimination and caution are indispensable. Much valuable practical information "on the use and abuse of atropine" will be found in an able paper by Mr. R. Liebreich, in "St. Thomas's Hospital Reports," 1873, p. 183. See also a paper by Dr. Talfourd Jones "in Brit. Med. Journal," July 28, 1877.

420. *In Iritis, whether Syphilitic, Rheumatic, or Idiopathic*, it is of importance to keep the edge of the iris free, and to allay the deep-seated pain which so generally accompanies this disease. Both these indications are answered by the introduction into the eye of a drop or two of a filtered solution of the extract (gr. xx., Aq. fl. ℥j.), or, better still, of a solution of atropia (gr. iv., Aq. ℥j.). The same applications are advisable in *deep Ulcers of the Cornea*, when the object is to prevent the iris becoming implicated in the ulcerative process. It is particularly necessary when the ulcer is situated near the centre of the cornea. *In painful Iritis and threatening Glaucoma*, Dr. Anstie considers that the hypodermic use of atropia promises to prove valuable. In two cases of the latter affection he believes that he succeeded in preventing its development by the use of $\frac{1}{60}$th grain subcutaneous injections of atropia. Mr. Dixon's experience, however, is adverse to the use of belladonna in the acute stages of iritis. Ophthalmic surgeons are, however, averse to its employment in *Glaucoma*, when they prefer Eserine (gr. iv.–℥j.).

421. *In Scrofulous Ophthalmia*, belladonna, or, better still, atropia, has a more marked influence in relieving pain than any other local application. In obstinate cases which resist ordinary treatment (*vide* QUININE), Mr. H. Power[2] speaks highly of Ext. Belladonna in doses of $\frac{1}{8}$–$\frac{1}{4}$ gr. given internally. He found it rapidly diminish the intolerance of light, and relieve the spasmodic motion of the eyelids, at the same time that it seemed to regulate the bowels. It should at once be discontinued if it cause thirst, &c. Commenting

[1] St. Barth. Hosp. Reps. 1878, p. 75. [2] Practitioner, Oct. 1872, p. 207.

on this, Dr. J. Braithwaite[1] remarks that belladonna is so effectual that it should be given at once without waiting till other means fail; that its efficacy is much increased by combination with iodide of potassium; and that the extract, mixed with glycerine, applied to the eyelids, eyebrows, and temple, is preferable to a solution of atropia applied directly to the eye. For internal use he recommends the following:—℞ Ext. Belladonna gr. iv., Potass. Iod. ʒj., Aq. ʒviii. M. Of this the dose for a child æt. two is two spoonfuls every four hours, increased gradually as circumstances require.

422. *In Cataract*, many advantages are derived from belladonna. It is generally admitted that an operation should be deferred until the cataract is mature; that is, until the sight has totally failed. To ascertain this point, a drop or two of a solution of atropia should be dropped into the eye night and morning, so as to dilate the pupil fully. When, after this application, the patient is unable to distinguish objects, the cataract may be considered mature, and the time arrived for an operation. Previous to having recourse to this manipulation, the atropia solution should be dropped into the eye, to allow the operator a full view of the seat of the disease, and to facilitate the operation.

423. *In Photophobia*, Mr. Brudenell Carter[2] recommends a perfectly neutral solution of sulphate of atropia, gr. j. ad Aq. fl. ʒj., for an adult; half that strength for a young child, repeated every four hours. He directs a large quill, cut in the form of a scoop, to be dipped in the solution, so as to take up a drop; the lower eyelid should then be depressed sufficiently to allow the scoop to touch the internal surface near the outer canthus, when the drop will enter between the lids and diffuse itself over the surface of the eye. Should there be much lacrimation, so as to dilute the solution, it may be applied more frequently. In some rare cases belladonna, in any form, occasions so much irritation that its use has to be abandoned. In such cases Mr. Vernon[3] suggests the substitution of a liniment of the extract and glycerine. The use of an ointment rubbed into the margin of the everted lid avoids the irritation and lacrimation which sometimes follow the use of the drops.

424. *Diseases of the Genito-urinary System. In Spasmodic Stricture of the Urethra, and of the Sphincters of the Bladder and Rectum*, the extract smeared on a bougie and introduced into the urethra, or rubbed into the perinæum, often has the effect of relaxing the spasm and affording relief. Mr. Savory,[4] whilst admitting that it is sometimes useful, especially when locally applied, thinks that it bears no comparison in efficacy to opium (*q.v.*). Mr. C. Heath[5] prefers its internal administration in these cases, and he mentions one troublesome case of spasmodic stricture of the urethra in which great benefit was derived from ♏ij. of the tincture every four hours. Mr. R. Harrison,[6] believing that belladonna possesses a special power of directly influencing and effecting

[1] Practitioner, Nov. 1872, p. 319.
[2] Practitioner, Jan. 1869.
[3] St. Barth. Hosp. Reps. 1877, p. 172.
[4] Brit. Med. Journ. Dec. 20, 1873.
[5] Practitioner, Nov. 1868.
[6] Practitioner, Jan. 1869.

a change in the obstructing matter of urethral strictures, employs it in the form of urethral suppositories (Ext. Belladon. gr. ij., Cocoa Butter q.s.) which are introduced twice daily, in conjunction with the use of the metallic bougie; they should be continued for some time after the latter has been left off. Under this treatment, he considers that very great and permanent benefit has accrued, when the use of bougies alone had only effected very temporary relief. He also speaks strongly of the value of belladonna in the form of *Irritable Bladder*, most frequent in females, in which the epithelium is copiously deposited in the urine. The value of this remedy in *Irritable states of the Bladder* had been previously pointed out by Mr. Behrend.

425. *In Suppression of the Urine*, whether accompanied by uræmia or not, belladonna is indicated. As both the sluggish circulation and the torpid kidney are simultaneously aroused by this medicine, there is ground for expecting a restoration of the renal secretion. (Dr. Harley.) *In Acute Nephritis*, benefit may also be expected from belladonna, which coming in contact with the irritated and congested organ, will doubtless calm the nervous irritation, and at the same time contract the dilated blood-vessels. Dr. Harley is also of opinion that it is very serviceable in *Chronic Albuminuria*, provided that the kidney has not passed into the degenerative state bordering on fatty degeneration. From a consideration of its physiological action, there is solid ground for a fair trial of belladonna in all these cases.

426. *In Spermatorrhœa and Nocturnal Emissions*, Mr. R. M. Jones[1] found belladonna alone in gradually increasing doses produce very beneficial results, even in extreme cases. It seems well worthy of further trials.

427. *In Chordee*, a suppository containing gr. ij. of Ext. Belladonna and gr. $\frac{1}{3}$ of morphia, is one of the most effectual remedies. (Mr. Berkeley Hill.)[2]

428. *In Orchitis*, apply a mixture of equal parts of Ext. Belladonna and glycerine, smeared thickly on a piece of lint large enough to envelop the scrotum; over this apply flannels wrung out of very hot water, and change every two hours. (Hill and Cooper, p. 554.)

429. *In Phimosis and Paraphimosis*, belladonna ointment (12 parts of the extract to 30 of lard) has occasionally been found effectual. The ointment is to be gently rubbed over the parts every hour until relief is obtained

430. *In Inflammation of the Uterus*, we must rely mainly on depletion, the hip bath, and anodynes: of the latter, Dr. West (p. 105) prefers belladonna, commencing with doses of gr. $\frac{1}{6}$ to $\frac{1}{4}$ of the extract (with gr. iij. of camphor), every three or four hours, increasing the dose as the patient can bear it. A large linseed poultice, into which 1 oz. of Tr. Opii is incorporated, will materially aid in affording relief.

431. *In Uterine and Ovarian Neuralgia, and Neuralgic Dys-*

[1] Lancet, Nov. 20, 1870.

[2] Lancet, April 29, 1871.

menorrhœa, Dr. Anstie[1] recommends the extract in doses of gr. $\frac{1}{6}$ as a palliative; or, still better, the subcutaneous injection of the sulphate of atropia ($\frac{1}{120}$–$\frac{1}{60}$ gr.) injected twice daily and continued for several weeks, carefully keeping within the line of toxic symptoms, and at once reducing the quantity when marked diplopia or dryness of the throat appeared. Thus employed it was found sufficient in many cases to remove the neuralgic tendency. Some constitutions, however, are very intolerant of belladonna in any form; in these morphia (gr. $\frac{1}{6}$ of the acetate) may be advantageously substituted for the atropia. In all these cases it is, of course, of primary importance to remove, if possible, all local, temporary, or extrinsic sources of irritation. *Most cases of Dysmenorrhœa, and many other painful and irritable states of the Uterus*, are benefited by the application of a belladonna plaster to the sacrum. The extract (gr. ij.) in the form of vaginal pessary is also frequently of great service. Dr. West (p. 87) advises a liniment of belladonna and chloroform to the loins night and morning, and Dr. Priestley ("Syst." v. p. 740) recommends the following as useful for relieving suffering at the menstrual periods. ℞ Ext. Belladonna gr. $\frac{1}{3}$, Camphoræ gr. iij., Ext. Hyoscyam. q.s. Ft. pil. j. to be taken every three or four hours as required.

432. *In Pruritus Pudendi*, Dr. West (p. 646) speaks highly of the value of belladonna. He commences with gr. $\frac{1}{2}$ of the extract, with grs. iij. of camphor, and increases the belladonna until dimness of vision or dryness of the throat is produced. Locally, he directs an ointment of grs. xx. of the extract, and ʒiv. of Ung. Cetacei or Glycerine to be smeared twice a day over the surface. The relief which these combined means afford is sometimes permanent.

433. *In Incontinence of Urine in Children*, belladonna often proves serviceable. The child should be induced to empty the bladder before lying down and immediately on awakening.

434. *Diseases of the Abdominal Viscera. In obstinate Constipation*, belladonna is often, in virtue of its antispasmodic action, successful when the strongest purgatives fail. *In Habitual Constipation*, especially when there are morbid growths or conditions interfering with comfortable defæcation, or where hæmorrhoids exist, the extract (gr. $\frac{1}{4}$–gr. j. twice daily) produces very satisfactory results: so much so that Dr. Duckworth[2] believes that medication by belladonna alone in many cases of habitual constipation deserves to be classed amongst the best efforts of modern therapeutics. Dr. Norman Kerr[3] gives an interesting account of five cases of *Intestinal Obstruction*, treated with belladonna in large doses. All recovered, though in three acute cases gr. ij. of the extract were given every hour, and 16, 14, and 12 grains were respectively administered. *In Intussusception of the Bowels*, it is well worthy of a trial, especially in the form of enema. In this class of cases, it is far superior to opium, which has a dangerous tendency to mask symptoms. (Jacobson.) Rubbing the surface of the abdomen

[1] Brit. Med. Journ. Aug. 22, 1868.
[2] Ranking's Abstract, liii. (1871), p. 85.
[3] Brit. Med. Journ. Aug. 31, 1878.

with an oleaginous application containing belladonna is oftentimes useful in intractable cases of constipation. *In the Passage of Gall-stones*, Dr. Murchison (p. 350) states that on several occasions he has seen marked utility from the extract, gr. ½ every two or three hours. *In the Vomiting of Pregnancy*, Dr. Routh found large doses of the tincture (♏xx.–xxx.) every three or four hours of great service; and the same was derived by Dr. W. M. Campbell,[1] from very small doses (♏ij.) frequently repeated. *In Stricture of the Œsophagus*, frictions with belladonna liniment to the sternum are often very useful as a palliative.

435. *In Fissures of the Anus*, Dupuytren, with the view of inducing relaxation of the sphincter, employed with advantage the following ointment:—℞ Ext. Belladon., Plumbi Acet. āā ʒj., Adipis ʒvj., M., applied three or four times daily. In slight cases Mr. C. Heath found great benefit from the use of a bougie smeared with equal parts of the extract and mercurial ointment. Belladonna ointment, locally applied, often affords great relief in *Painful Hœmorrhoidal Tumours and Piles.*

436. *As a remedial agent in Scarlet Fever*, belladonna appears to be a valuable remedy. Dr. Burne, Sir E. Wilson, and others have reported favourably of its efficacy. They advise the extract, in doses of gr. ½–gr. j., every three, four, or six hours, dissolved in water; to be continued until it produces dilatation of the pupil and a degree of stupor.

437. *In Tonsillitis*, belladonna is a remedy of great value. Dr. Handfield Jones[2] regards it as more appropriate where the tonsils are acutely inflamed than in those cases where there is general inflammation of the fauces, without special affection of the tonsils. It requires to be given in full and repeated doses, to be diminished or discontinued as soon as the throat symptoms are materially relieved, or on the production of any toxic effect.

438. *In Ptyalism*, Dr. C. H. Wood (p. 265) found belladonna arrest the flow of saliva almost at once in several cases, and seemingly facilitate greatly the return to health.

439. *In Earache*, Dr. A. D. Williams[3] regards atropia as almost a specific. He drops a solution of the sulphate (gr. j., Aq. ʒj., for a child under three years; gr. iv., Aq. ʒj., over ten years), warmed, into the ear, and allows it to remain there ten or fifteen minutes. In adults almost any strength may be used. It is, he says, practically a specific in the recurring nocturnal earache of children, but only a slight palliative in acute inflammation of the middle ear, or of the external meatus.

440. *In Erysipelas*, the internal use of belladonna, in repeated doses of $\frac{1}{10}$ of a grain, is often very effectual in reducing the excitement of the arterial system, and in procuring rest. It is best given after the exhibition of aconite (see sect. 48). Mr. C. Heath speaks favourably of it in these cases. Belladonna has been administered internally in cases of *Severe Burn* by Mr. Hutchinson.

[1] Brit. Med. Journ. June 4, 1881.
[2] Lancet, Jan. 7, 1871.
[3] Brit. Med. Journ. Oct. 28, 1882.

He has found it of most use in children in whom general febrile symptoms, attended with restlessness and loss of appetite, have set in without local complication. Where the burn itself is very painful, and the patient unable to procure sleep, belladonna is inferior to morphia.

441. *In Phlegmasia Dolens*, much benefit sometimes arises from the local application of an ointment composed of equal parts of mercurial ointment and extract of belladonna.

442. *In Palpitation connected with Valvular Diseases of the Heart*, very often rest in bed, with a belladonna plaster or lotion over the heart, or even rest alone, soon causes the palpitation to cease. (Dr. Waters, p. 375.) In severe cases it is inferior in efficacy to digitalis (*q.v.*). Dr. E. Sansom[1] speaks of it as very useful occasionally in mitral disease, but by no means to be compared with digitalis for prolonged employment. He employed very satisfactorily in some cases hypodermic injection of atropia, gr. $\frac{1}{60}$ with digitaline gr. $\frac{1}{50}$. Dr. Harley (p. 247) speaks highly of the benefit he has derived from belladonna in *Pneumonia*. Under its use the grave symptoms rapidly subsided, and convalescence was speedily established.

443. *In Insanity*, belladonna has been favourably noticed by Dr. Millingen and others, and Schroeder Van der Kolk (p. 156) states that he has many times used it with good effect as an antispasmodic combined with aloes (sect. 57). As a general narcotic, however, he ascribes to it rather an injurious action. "The sleeplessness of idiopathic mania," he remarks, "must not be opposed by narcotics, which would have only an injurious effect. Sedative narcotics are only suitable where the sleeplessness is a residuum of increased sensibility without any appearance of excited activity of the vascular system."

444. *Coryza* in its first stage may, according to Dr. Gentilhomme,[2] be cut short by the early administration of atropia (♏½ to ♏ij. of the liquor). It produces great relief where the coryza is confirmed, but its action is less remarkable than at the beginning of the attack.

445. *In Typhus and other Low Fevers, attended with a contracted state of the pupil*, Dr. Graves advises belladonna, with a view of correcting that condition of the brain which gives rise to this symptom. He looks upon a contracted state of the pupil as contra-indicating the administration of opium, and mentions several cases remarkably benefited, when that symptom was present, by the exhibition of belladonna, combined with musk or tartar emetic. *In Typhoid* (*Enteric*) *Fever*, the value of belladonna is strongly insisted upon by Dr. B. Kelly, of Dublin, who considers that it counteracts the poison of typhoid. He waits till the fever is fully developed, and then commences with the tincture in doses of gutt. xx.–xxv. every four hours, varied of course according to circumstances. He generally uses the following mixture:—℞ T. Bellad. fl. ʒij.,

[1] Med. Press, Feb. 7, 1883.

[2] Practitioner, Dec. 1882.

Syr. Aurant. fl. ℥ss., Aq. Menth. Pip. ad ℥viij. M. ℥ : part every four hours, to be continued with little or no variation for not less than two weeks. Nothing more serious than moderate dilatation of the pupil and slight dryness of the fauces follows these large and continued doses. Stimulants during its exhibition are absolutely interdicted, but a nourishing diet, soup, milk, arrowroot, &c., is advised. Dr. Kelly's statements as to the efficacy of this treatment are most encouraging, and sufficiently conclusive to warrant further trial. Dr. Harley (p. 256) testifies to its value in these cases, and he also found it serviceable in modifying the more prominent symptoms in *Typhus Fever*. For a further exposition of Dr. Harley's views and experience as to the value of belladonna in Enteric Fever, see an able paper by him in St. Thomas's Hospital Reports, 1875, p. 199.

446. *Lacteal Congestion threatening Mammary Abscess.* The lactifuge property of belladonna was first noticed by Dr. Goolden. He cites two cases in which the external application of the extract around the areola of the breast was followed by a marked decrease and eventual arrest of the lacteal secretion. Its efficacy is attested also by Mr. Burrows, of Liverpool, and Mr. Blytham.[1] Dr. Hugh Miller[2] found most effectual a combination of alcoholic extract of belladonna, camphor, and collodion, painted over the breast. The fluid dries quickly, and some degree of pressure is brought to bear on the part. All rubbing, which is objectionable, is avoided.

447. Atropia. Atropia. An alkaloid obtained from Belladonna. Liquor Atropiæ. Atropiæ Sulphas. Sulphate of Atropia. Liquor Atropiæ Sulphatis. (Gr. iv., Dist. Water fl. ℥j.) Vaseline is regarded by Mr. Milles[3] as a preferable solvent (grs. iv.–viij. ad Vaseline ℥j.)

Med. Prop. and Action. The same as belladonna, but far more energetic in its action. It is a powerful poison, and should only be given internally with the greatest caution. Introduced hypodermically it is an extremely valuable anodyne, and antispasmodic. For this purpose it should be employed in the form of a solution of the sulphate, ♏iv. containing $\frac{1}{60}$ gr.; of this ♏ij. (or gr. $\frac{1}{120}$) will be the proper commencing dose in adults, unless the pain to be relieved is very severe. It should be cautiously increased to $\frac{1}{60}$ or $\frac{1}{50}$ gr.; more can seldom be needed, and poisonous effects are apt to follow larger doses. The occurrence of slighter symptoms of atropism (dryness of the throat, vertigo, and diplopia) which are occasionally produced by smaller doses than those indicated above, is an indubitable sign that it would be unsafe to push the remedy to a greater extent. It requires to be used with the greatest caution. Atropia does not appear to be a direct hypnotic, but it makes sleep possible by relieving severe pain. It is somewhat less frequently tolerated than morphia, but some persons who are unable to bear morphia will bear atropia, and *vice versâ*; and in cases where both remedies are equally tolerated, sometimes morphia, and sometimes atropia (the latter most frequently) will produce a *permanent* effect. (Dr. Anstie.)[4] Dr. Brown-Séquard suggests the advisability of employing a combination of

[1] Ranking's Abstract, vol. xxvii. p. 214.
[2] Edin. Med. Journ. Dec. 1877.
[3] Ophthal. Hosp. Reps. Aug. 1882.
[4] Practitioner, July 1868.

atropia and morphia, so as to obtain the good effects of both these agents at once, and counteract any ill effect which either alkaloid singly might produce. This combination (Atropiæ Sulph. gr. $\frac{1}{30}$ Morphia gr. $\frac{1}{4}$) was tried by Dr. J. M. Finny.[1] He found it diminish the nausea so commonly following the use of morphia, and to produce anodyne effects not to be obtained by morphia alone: if the proportion of atropia was increased, atropism followed, but this was counteracted by the administration of more morphia. (See also Opium.) Externally, it may be employed in the form of ointment (Atropia gr. viij., Rect. Spirit. fl. ʒss,, Lard ʒj. Dissolve the atropia in the spirit, add the lard, and mix thoroughly).

448. For the purpose of dilating the pupil, Liq. Atropiæ diluted with four times its bulk of water may be employed. One drop of this solution is to be applied to the eye. Mr. Streatfeild[2] proposes for local use in eye diseases, "Atropine paper," prepared by imbuing coloured tissue-paper with a solution of the sulphate, of such a strength that a small square piece of it is equal to or contains as much of the salt as a drop of the strong solution in ordinary use. The little piece of paper (one-fifth of an inch square) is taken up on the top of the forefinger, previously damped; and the patient's lower lid being drawn down, he is told to look upward, and the scrap of paper is put on the sclerotic conjunctiva below the cornea, almost without the knowledge of the patient; the lid is then let go, and the piece of paper left *in situ*. A handkerchief is then tied over the eyes. The full mydriatic effect is induced quite as rapidly as with the solution, and the paper is more readily carried and more easily applied. It may be subsequently easily removed. Blue paper is preferable to white for this purpose, as it is more readily distinguishable when it has to be removed. Subsequent observations have induced Mr. Streatfeild and Mr. E. Hart, who has also investigated the subject, to substitute thin plates of atropised gelatine for paper. The gelatine being soluble in the secretions of the eye, does not require removal. Mr. Hart employs squares of this substance containing only 100,000th of a grain of atropia to the square. He finds that the higher strength originally proposed by Mr. Streatfeild (240th of a grain) produces for a time paralysis of the accommodation of the eye, and consequent inability to adjust vision for near objects. Recontraction is effected by similar squares of gelatine impregnated with extract of Calabar bean. Occasionally, as pointed out by Mr. G. Lawson,[3] atropia locally applied to the eye, induces great irritation and even an erysipelatous condition; and a case is mentioned by Dr. Bowles[4] in which poisonous effects followed the application of gutt. ij. of Liq. Atropiæ. The cases, however, are rare, and depend upon the idiosyncrasy of the patient. Atropine discs are now prepared, and largely used in ophthalmic practice.

Dose of Atropia, gr. $\frac{1}{50}$-$\frac{1}{20}$. It is rarely given internally.

449. *Therapeutic Uses.* See Atropa Belladonna.

Aurantii Cortex et Flores. See Citrus Aurantium.

450. Balsamum Peruvianum. Balsam of Peru.

Med. Prop. and Action. Stimulant and expectorant. In common with the other balsams, it appears to act upon the mucous surfaces generally, but particularly upon that of the air-passages. Externally applied, it is a mild stimulant.

Dose:—mx.-xv. or more. It may be taken in the form of emulsion with mucilage, or on sugar, or made up into pills with some absorbent powder.

[1] Dublin Med. Journ. July 1872.
[2] Ophthal. Hosp. Reps. April 1862.
[3] Ophthal. Hosp. Reps. April 1868.
[4] Brit. Med. Journ. April 29, 1876.

451. *Therapeutic Uses. In Chronic Bronchitis, Coughs, &c.*, the balsams of Peru and Tolu are very useful stimulant expectorants, and may be advantageously added in the form of emulsion to squills and other remedies of the same kind. Benefit has also been derived from inhaling the vapour of these balsams, generated by placing them upon hot coals or a heated piece of iron. So long as inflammatory action is present they are inadmissible. The vapour has also been found useful in *Chronic Laryngitis*, and the same, generated by adding balsam of Peru (gutt. x.) to boiling water (18 oz.) is commended by Dr. M. Schmidt[1] in *Laryngeal Phthisis:* to be inhaled for five minutes three or four times a day, and persevered in for months.

452. *In Otorrhœa*, Dr. A. T. Thomson (p. 564) states that he has found a mixture of fl. ʒj. of the balsam, and ʒij. of ox-gall extremely useful when dropped into the ear every day. The aural passage should be first well syringed out with soap and water.

453. *In Diphtheria*, Dr. Morell Mackenzie (p. 164) speaks favourably of an etherial solution of the balsam of Tolu (1 in 5) as a local application or varnish. He prefers it to benzoin and mastich, as being pleasanter to the patient, and lasting longer as a varnish, hence requiring less frequent application. The surface of the false membrane should be dried with blotting-paper before the application is made. (Dr. Mackenzie.)

454. *In Gonorrhœa*, balsam of Peru has been recommended: it is sometimes borne when copaiba and other specifics disagree. (Hill and Cooper, p. 515.)

455. *To Sore and Chapped Nipples*, the topical application of the balsam in the form of ointment (fl. ʒss., lard ʒj.) often proves serviceable in mild cases. *To Chapped Lips and Hands* the same formula may be used with advantage. *To Unbroken Chilblains* the following is Dr. Purdon's favourite application:—℞ Bals. Peruv. ♏xxx., Sp. Rect. fl. ʒss. Dissolve and add Acid. Hydrochlor. Dil. ♏xxx., T. Benzoin Co. fl. ʒss., M. This may be rubbed on occasionally, or may be applied continuously on a piece of lint. At first it causes a little smarting.

456. *In Alopecia and Baldness*, Dr. Copland states that he has in several instances employed the following formula with complete success:—℞ Adipis ʒij., Ceræ Alb. ʒss.; melt before a slow fire, and add Balsam of Peru fʒij., Ol. Lavand, ♏xij.; stir till cold. This, he adds, has the effect of rendering the hair thick and persistent, and of promoting its growth in parts from which it had fallen out from impaired action of the follicles.

457. Balsamum Tolutanum. Balsam of Tolu.

Med. Prop. and Action. Stimulant expectorant. It is particularly recommended by its pleasant aromatic flavour, and is one of the mildest of the balsams; but it is, nevertheless, contra-indicated in all active inflammatory states of the lungs and air passages. The syrup is an agreeable and useful adjunct to cough mixtures.

[1] Edin. Med. Journ. Sept. 1881.

458. *Therapeutic Uses.* Similar to those of Balsam of Peru, but milder.

459. Beberia Sulphas. Sulphate of Beberia. The sulphate of an alkaloid from the bark of the Bebeeru-tree (Nectandra Rodiæi, *Schomb.*), a lauraceous tree of British Guiana.

Med. Prop. and Action. Beberia has been suggested as a substitute for quinine. It is said to cause less headache, or gastric disturbance. It is also cheaper. Warburg's drops are stated by Royle to contain Beberia.

Dose:—Of Sulphate of Beberia, as a tonic, gr. j.–v.; as an antiperiodic gr. v.–x., thrice daily, in solution with sulphuric acid.

460. *Therapeutic Uses.* Dr. Maclagan introduced its use in 1843, and found it highly serviceable in intermittent fevers, especially when cerebral disturbances were present. Three- to four-grain doses, given every three or four hours, answer well. Its efficacy as an antiperiodic is, however, doubtful.

461. *In Convalescence after Fevers and other debilitating diseases,* it is an eligible tonic.

462. *In Neuralgia, Tic Douloureux, and in the Periodical Neuralgia of Pregnancy,* Dr. Maclagan found it eminently successful, even in cases in which quinine had previously failed. In some cases one dose of gr. x., night and morning, is preferable to several small ones.

Belladonna. See Atropa Belladonna.

463. Benzoinum. Benzoin. It contains a resin, 76 to 80 per cent., a volatile oil, and a peculiar acid, Benzoic Acid (*q.v.*).

Med. Prop. and Action. Expectorant and stimulant of the mucous membranes, and of the urinary and bronchial tracts particularly. The benzoic acid it contains is converted into hippuric acid, and is eliminated by the kidneys, the urine becoming more acid and stimulating during its administration. It is contra-indicated in all inflammatory and febrile affections. It is rarely given internally. Externally, under the name of Friar's Balsam, the compound tincture has long been a popular stimulant application to *Wounds, Ulcers,* &c. Its great value in this class of cases, especially to contused, freshly inflicted wounds, is attested by the experience of Mr. T. Bryant,[1] Mr. Sampson Gamgee,[2] and others. The former furnishes a record of 14 cases of *Compound Fracture* treated by closing the wounds as soon as possible after the accident with lint saturated with T. Benzoin Co. In each case the results were almost uniformly satisfactory; it evidently exercised a most beneficial action in the "dry dressing" of wounds advocated by Mr. Gamgee, in which position rest and pressure are the cardinal indications; poultices and water being prohibited; he employs the compound tincture on lint to the wound, over this a pad of absorbent gauze and cotton, and then a compressive bandage. He considers that it acts as a coagulant and antiputrescent. Mr. Squire (p. 64) recommends a lotion of 1 part of tincture and 40 of rose-water for *protecting the face from the action of the sun.*

Dose:—Of Benzoin, gr. x.–xxx. in emulsion.

464. *Therapeutic Uses. In Dysentery,* especially in the subacute, asthenic, scorbutic, and purely chronic forms, and also in simple *Mucous Diarrhœa,* whether in adults or children, Dr. Chipperfield,

[1] Lancet, Nov. 25, 1876. [2] Lancet, Nov. 25, 1882.

of Madras,[1] testifies to the efficacy of the compound tincture. He prescribes it as follows:—For adults, ℞ Pulv. Acaciæ gr. xxx., T. Benzoin. Co. ʒj.–ʒij., T. Opii ♏xx.–xl., Aq. Carui. ad ℥vj. M. Dose: a fourth part every four hours. For infants and children: T. Benzoin. Co. ʒj., Vin. Ipecac. ʒj., Syrup. ℥ss., Aq. ad ℥ijss. M. Dose: one to three teaspoonfuls every two, three, or four hours. It may likewise be advantageously used in the form of enema. Further evidence of its value in dysenteric affections of India is furnished by Dr. R. Donaldson.[2] He strongly advises the following:—℞ T. Benzoin. Co. ʒss., T. Catechu Co. ʒj., T. Opii ♏x., Ext. Hæmatoxyli gr. x., Aq. ad ℥j. M. To be repeated twice daily. It may also be given *per rectum*.

465. *In Chronic Laryngitis and Chronic Catarrhs*, MM. Trousseau and Pidoux (i. p. 467) consider that benzoin fumigations are of great service. They advise the air of the patient's apartment to be impregnated with the vapour of benzoin, the drug being thrown upon burning coals; or it may be inhaled from a common inhaler, the balsam being placed in boiling water. *Acute Inflammation of the Fauces accompanying Syphilitic Ulcers of the Mouth* is relieved by the inhalation of the steam of hot water to which ʒj. T. Benzoin. Co. has been added. (Hill and Cooper, p. 438.)

466. *In Irritable States of the Bladder*, Dr. Prout (p. 339) derived much benefit from the tincture of benzoin associated or alternated with infusion of diosma. It should be given, he observes, in small doses, largely diluted, and persevered in for a long time. Mr. Soden relates four cases successfully treated with this medicine. On account of the benzoic acid it contains, it would be indicated as a diuretic where the kidneys require stimulating, and in cases of phosphatic deposit and of alkaline urine.

467. *In Pruritus Scroti*, Sir E. Wilson (p. 344) states that pencilling the parts with the compound tincture will be found useful. Diluted, it is occasionally useful in allaying the itching of *Urticaria*, *Scabies*, and other skin diseases.

468. Benzoic Acid. Acidum Benzoicum. A crystalline acid obtained from Benzoin by sublimation.

Med. Prop. and Action. Stimulant, particularly of mucous surfaces; the vapour causes great irritation of the air-passages. In the system it is converted into Hippuric Acid by the assumption of the elements of glycocol ($HC_7H_5O_2 + C_2H_5NO_2 = C_9H_9NO_3 + H_2O$). (Garrod.) It renders the urine acid and stimulating. As an antiseptic it was first brought to notice by Dr. Dougall,[3] who pronounced it one of the most active of this class of agents. The subsequent researches of Salkowski, Grube, Fleck, and Bucholtz agree unanimously in according to it a first rank in destroying bacteria, and preventing putrefaction; superior in some instances to salicylic acid. There would appear to be no doubt that benzoic acid may be substituted for carbolic or salicylic acid in antiseptic surgery. (H. Wood, p. 544.) The benzoates of ammonia and soda (*q.v.*) are eligible forms for its internal administration.

Dose:—Of Benzoic Acid, gr. x.–gr. xv.

[1] Madras Journ. Med. Sci. xi. 1867.
[2] Indian Med. Gaz. June 1876.
[3] Med. Times, April 1872.

469. *Therapeutic Uses. Calculous Diseases.* Mr. Ure[1] observed that when benzoic acid was taken into the system it was converted into hippuric acid, and that in this form it was excreted in the urine. He considered that this change was effected by the benzoic acid acting upon the uric acid, and therefore he proposed it as a means of correcting the uric or lithic acid diathesis. Dr. Keller showed this supposition to be incorrect; and the experiments of Dr. Booth[2] on this subject give the following results:—(1) That the introduction of benzoic acid into the system does not in any way affect the uric acid; (2) that the time required for the conversion of benzoic acid into hippuric acid, and its subsequent appearance in the urine, is about twenty minutes, and the effect lasts from four to eight hours; (3) that the amount of hippuric acid exceeds that of the benzoic by about one-third; (4) that urea is not in combination with hippuric acid in the urine. These results prove the inutility of benzoic acid as a remedy for uric acid diseases. Dr. Garrod, in repeating these experiments, found that he could by means of this acid produce a very acid state of the urine, enabling that fluid to hold in solution a large amount of phosphatic salts. He employed it in a case of paraplegia, when the urine was highly alkaline, and deposited a large amount of the phosphates. He administered gr. xl. of the acid four times a day, and the *phosphatic deposits* soon became lessened, and in a few days entirely ceased. The urine also, when voided, was acid. When the medicine was discontinued the abnormal state of the urine did not return. A case of *Inertia of the Bladder, with strongly marked ammoniacal urine* (that fluid containing much ropy mucus and pus), is related by Mr. Ure,[3] which yielded to benzoic acid in ten-grain doses, twice daily. Its value in *Ammoniacal Cystitis* is fully confirmed by Drs. Gosselin and Robin,[4] who relate four cases successfully treated with it, commencing with gr. xv., rapidly increased to gr. xlv. or gr. lx. It may be even, in some cases, increased to gr. xc., provided this quantity be not persisted in for too long a time, as indicated by dryness and a sense of smarting in the pharynx. The average duration of treatment is from seven to eight days. It is best given suspended in mucilaginous or syrupy mixtures. Sir H. Thompson (p. 154) considers that it may, from its balsamic character, prove useful in *Chronic Cystitis*, in doses of not less than gr. xxiv. daily. He advises to be given in pills (gr. iii.–iv.) with glycerine.

470. *In Acute Rheumatism*, Dr. Senator, of Berlin,[5] reports very favourably of benzoic acid, regarding it as inferior in virtue only to salicylic acid. He prescribed it in daily doses of ʒij.–ʒiij., and states that larger doses may be employed with impunity. The benzoate of sodium is preferred to the pure acid, as of easier solubility. (Wood.) It has the great advantage over salicylic acid in not producing nervous symptoms, &c., when given in large doses. As a remedy in *Jaundice*, benzoic acid has attracted attention. It is

[1] Med. Chir. Trans., vol. xxiv. p 30.
[2] Trans. of American Philosoph. Society, vol. ix.
[3] Lancet, Nov. 23, 1863.
[4] Med. Times, April 24, 1875.
[5] Glasgow Med. Journ. June 1880.

applicable only to jaundice arising from suppression of the biliary secretion. Dr. Harley[1] mentions some cases in which benefit followed its use.

471. Bismuthi Carbonas. Carbonate of Bismuth.

Med. Prop. and Action. This preparation has been proposed by Prof. Hannon, of Brussels, as a substitute for the subnitrate. According to this writer, it is readily soluble in the gastric juice; its action is rapid, it produces no sensation of weight in the stomach, rarely constipates, colours the stools less than the subnitrate, and may be employed for a long time without oppressing the stomach. It also possesses the great advantage over the subnitrate of readily neutralizing the acids in excess which are found in the primæ viæ. Its action appears to be sedative during the first days of its employment, and subsequently it acts as a tonic. It is perfectly insipid, excites no repugnance, and may be taken before meals.

Dose for adults, gr. xv.–xlv. in divided doses daily; for children, gr. j.–v. Adults take it in water, children in honey. It may also be given in the form of lozenge.

472. *Therapeutic Uses.* These closely resemble those of the subnitrate, it being chiefly recommended in *Gastric and Intestinal Affections.* Dr. Hannon remarks that *all cases of Gastralgia*, and those in which digestion is laborious, accompanied with putrid or acid eructations, or in which there is a tendency to diarrhœa and spasmodic vomiting, demand the employment of the carbonate. *In the Vomiting of Children* during dentition, and in *Diarrhœa of weak Children* it may also be employed with every prospect of success.

473. *Typhoid Fever.* Sir W. Jenner[2] states that carbonate of bismuth (gr. xx. every four or six hours) is one of the best remedies he knows of for the *Catarrhal Inflammation of the Bowel* itself, occurring in this fever. If the fluid poured out be very excessive, he advises combining it with catechu or kino, and should this fail, with gutt. iij.–v. of T. Opii; but even in this dose opium by mouth should be avoided if possible. (See Opium.)

474. Bismuthi Subnitras. Subnitrate of Bismuth. White Bismuth.

Med. Prop. and Action. Sedative, astringent, and alterative. When given internally, it is absorbed into the system, and has been detected in the urine and in the milk. In very large doses it is usually regarded as poisonous, and a death from gr. cxx. of this salt is recorded. M. Monneret denies this, and avers that it is absolutely innocuous. Dr. Brinton states that large doses occasion a dark line on the dental edge of the gums. It is seldom efficacious in larger doses than gr. xv. *Externally*, it is a mild stimulant, and may be applied in the form of ointment (gr. cxx. Lard, or Cold Cream ʒj.).

Dose:—Of the Subnitrate, gr. v.–xx. *Of the Lozenges*, each of which contains gr. ij. of the subnitrate, 1 to 6.

475. *Therapeutic Uses. In Diseases of the Stomach* the subnitrate is a remedy of established value. *In Atonic Dyspepsia*, few medicines are more to be relied upon. Dr. Brinton (p. 329) regards it as specially useful in that form of dyspepsia which constitutes the

[1] On Jaundice, &c., 1863. [2] Lancet, Nov. 15, 1880.

"morbid sensibility of the stomach" of old writers. Here, he remarks, its effects in allaying flatulence and nausea and in preventing vomiting, and still more in checking the pain caused by food, are so marked, that we may fairly accept the term of sedative often applied to it. *In the milder forms of Gastric Inflammation*, bismuth, according to Dr. Wilson Fox (ii. p. 865), has a peculiarly favourable influence, and he states that he knows no remedy more beneficial in the *Gastro-intestinal Catarrh of Children*. He directs gr. iij.–v. for children; gr. x.–xx. for adults. It may be combined with magnesia or hydrocyanic acid, or when pain or diarrhœa is present, with morphia or laudanum. *In Pyrosis*, bismuth combined with opium seldom fails to relieve, though, in order to complete a cure, a more direct astringent—*e.g.*, P. Kino Co.—is required (Dr. Fox). Prof. Graves speaks of it as one of the best remedies we possess in *Gastrodynia*. *In Ulcer of the Stomach*, Dr. Brinton extols the subnitrate in doses of gr. x.–xx., every six or eight hours, either alone or with P. Kino Co. gr. v.–x. It often has a remarkable effect in relieving the pain and vomiting, as well as the diarrhœa when present. His estimate of it in these cases is very high. *Vomiting*, arising in connection with stomach diseases, is often allayed by bismuth, especially in combination with hydrocyanic acid; but in sympathetic vomiting—*e.g.*, from uterine disorder—it is of little or no value. In all the above cases the Liquor Bismuthi will sometimes be borne when the nitrate or carbonate in substance disagrees.

476. *In Diarrhœa, attended with debility or accompanying Phthisis*, Dr. T. Thompson[1] found great benefit from the subnitrate in doses of gr. v. three or four times daily. *In Subacute and Chronic Dysentery*, it is spoken of in high terms by MM. Récamier and Trousseau. It may be advantageously combined with Dover's powder. Dr. E. P. Houghton[2] and Dr. W. G. King[3] bear testimony to the great value of bismuth enemas in those forms of dysentery occurring in tropical lands—ʒss. of the subnitrate with ʒss. P. Acaciæ, with two ounces of cold water, injected once or twice daily, according to the severity of the case, the enema to be retained. Dr. King thinks it better to increase the bulk of the enema to four or five ounces. The severe tenesmus and tormina are relieved in a very short time. Its action appears to be simply mechanical.

477. *In Hæmorrhoids and Prolapsus Ani*, Dr. Cleland[4] speaks highly of the benefit to be derived from very small enemas, containing ʒij. (a dessert-spoonful) of the Liquor Bismuthi.

478. *In Coryza* (cold in the head) Dr. Ferrier[5] has found the nitrate, taken in the form of snuff, very effectual in speedily checking the nasal irritation, sneezing, &c. He advises the following formula:—℞ Bismuth. Trisnit. ʒvj., Pulv. Acaciæ ʒij., Morphiæ Hydrochlor. gr. ij. Of this a quarter or half may be taken as snuff in the course of the day. As the bismuth alone acts efficiently, as it did

[1] Med. Chir. Trans. xxxi. p. 305.
[2] Lancet, Oct. 4, 1879.
[3] Lancet, Oct. 18, 1879.
[4] Practitioner, Jan. 1876.
[5] Lancet, April 8, 1876.

in Dr. Ferrier's own person, it will be safer, in the first instance at any rate, to omit the morphia.

479. *In Ulceration of the Septum Nasi*, and also as a local application in *Chronic Skin Diseases*, Dr. Pereira states that he has used the ointment (*ante*) with advantage. Bismuth may also be employed locally as a sedative and astringent, mixed with glycerine. Dusted over the surface, finely powdered nitrate, either alone or conjoined with equal parts of starch, exercises a very soothing influence in *Eczema, Intertrigo, Urticaria*, &c. *In Ringworm* it has been advised (℥j. ad Ung. ℥j.), but it is far inferior to many other applications. *In a sore Erythematous condition of the Tongue, met with in chronic diseases*, Dr. Symonds advises the following application :—℞ Bismuth. Subnit. gr. xx., Glycerini fl. ℥j., Aquæ Rosæ vel Sambuci fl. ℥vj. M. ft. lotio. M. Follin applies a mixture of equal parts of bismuth and glycerine to the inflamed surface in *Chronic Granular Conjunctivitis*, and in *Ciliary and Glandular Blepharitis*. M. Dubout uses the same mixture as an application to *Eczema* of the axillary, anal, or vulval regions, and to *Chapped Nipples, Lips, and Hands*. M. Trousseau employs one part of bismuth with three of glycerine as an application to *Fissures of the Anus*.

480. *In Uterine Diseases* which induce or follow on gastric derangement, bismuth, as is shown by Dr. F. W. Mackenzie[1] has a special sphere of action. His cases seem to prove that the stomach was primarily at fault, as gastric pain has generally preceded the uterine affection. This is in accord with the experience of Dr. Phillips, who stated (p. 497) that in *Dysmenorrhœa* he has often given it with good effect, and that in *Menorrhagia* it has proved in his hands strikingly efficacious where recognized styptics had failed. *In Chlorosis*, Sir H. Marsh[2] pronounces bismuth an efficient substitute for iron, when from any cause the latter is not well borne.

481. *In Gonorrhœa*, when the discharge is serous, the following, according to Hill and Cooper (p. 518), forms a useful injection :—℞ Bismuth. Nit. ℥j., Mucilag. Tragacanth. ℥iv., Glycerini ℥iv., Aq. Dest. ad ℥viij. M. To be employed thrice daily for three or four days, and then discontinued.

Bismuthi Oleas. See Oleic Acid.

482. Bismuth may conveniently be given in the form of :—

483. Liquor Bismuthi et Ammoniæ Citratis. Solution of the Citrate of Bismuth and Ammonia.

Med. Prop. and Action. The advantages of this fluid are derived from the fact that the metal is in a state of perfect solution. It mixes with water and other fluids without precipitation. Dr. Martyn,[3] of Bristol, states that he finds it act better than the older preparations. It allays pain in acute irritability of

[1] *Loc. cit.* ex Lond. Journ. Med. 1857.
[2] Med. Press, March 6, 1867.
[3] Lancet, July 11, 1863.

the stomach (without nausea or much acidity), especially that which remains after ulceration. He is in the habit of giving it simply diluted with water.

Dose, fl. 3 ss.–fl. 3 j.

Therapeutic Uses. Same as those of the subnitrate of bismuth (*q.v.*).

484. Boracic Acid, formerly known as Homberg's Sedative Salt: obtained by the action of Sulphuric Acid on a solution of Borax. It occurs in the form of white translucent scales, soluble 1 in 30 parts of cold water, 1 in 3 of boiling water, and 1 in 4 of glycerine. In solution in alcohol it burns with a characteristic green flame. (Squire.)

Med. Prop. and Action. Valuable antiseptic and sedative, introduced as an agent in antiseptic surgery by Professor Lister in 1872, and now extensively employed. The most convenient forms for use are boracic lint and cotton wool, a concentrated watery solution and an ointment. Boracic lint is prepared by soaking lint in a saturated boiling solution of the acid; on drying the lint, a copious deposit of fine flaky crystals (very soft, almost greasy, closely resembling the crystallizable fats in physical properties) takes place between its fibres. Cotton wool may be similarly served, and when dried and carefully picked out, forms a very useful dressing. The concentrated solution is made by dissolving the acid in boiling water to saturation; and the ointment by incorporating 3j. of the acid with 1 oz. of simple ointment or benzoated lard. Unlike most antiseptic agents, boracic acid is bland and unirritating; and whilst its non-volatility renders it less useful in some cases than carbolic acid, its great superiority to this and the chloride of zinc is its unirritating nature. The boracic lint is best suited as a dry dressing, and for recent wounds, where simplicity is required, it has no equal. A pad of lint, applied over the wound and kept in place by strapping, is all that is required, and union by first intention is a common result. Briefly to sum up the advantages of boracic acid: (1) It is an antiseptic which does not irritate and inflame, and so allows the natural process of healing to go on without interruption. (2) It is exceedingly simple in its application, and can be used apart from all the details required by a thoroughly antiseptic method. (3) It can be used in the shape of lint, lotion, cotton wool, or in combination with most other methods of treatment; and (4) Its cost is trifling, an object in parish and dispensary practice. (Dr. L. Cane.[1]) As an internal remedy it has been comparatively little used, and its properties are consequently little known; but it certainly possesses two advantages over many other drugs: (1) it is almost tasteless, and (2) in moderate doses it is innocuous.

Dose:—Gr. x.–xv. thrice daily or oftener, in solution. As an external application, *ante.*

485. *Therapeutic Uses.* Considering its antiseptic powers, Dr. F. P. Atkinson [2] considers that boracic acid ought to hold an important place in the treatment of—*Carbuncular Disease, Erysipelas, Cholera, Scarlatina, Enteric, Typhus* and *Intermittent Fever*—in fact, in all those cases which are known to have a septic origin. In *Puerperal Fever* he found this acid, combined with sulphuric ether and a little T. Opii occasionally, afford decidedly beneficial results. Rosenthal,[3] of Vienna, has reported highly of it in *Cystitis* and *Vesical Catarrh*, taken to the extent of grs. xxx. in

[1] Lancet, May 20, 1876.
[2] Practitioner, April 1884.
[3] Practitioner, April 1882.

solution, daily: in severer cases of *Cystitis Ammonialis* he derived benefit from washing out the bladder twice a day with a five per cent. solution of the acid. Mr. W. J. Butler,[1] Madras Medical Service, successfully employed it in *Cholera*, gr. x. every two hours, combined with borax or carb. of soda. It has been advised in *Diabetes*, but Dr. Shingleton Smith,[2] states that he has tried it with no good result.

486. *In Skin Diseases* of vegetable and parasitic origin—*e.g.*, *Pityriasis versicolor*, *Tinea circinata*, *Sycosis*, also in *Eczema*, *Intertrigo*, *Erythema of Infants*, a boracic ointment, prepared by incorporating the finely powdered acid (ʒiss) with vaseline (ʒj.) has been found most useful by M. Championnière[3] and others. He likewise found it an effectual application in *Fetid Sweating of the Feet*. This affection, Dr. Thin[4] has shown, is caused by the rapid development of bacteria (Bacterium fetidum) in the fluid which exudes from the soles of the feet, and the treatment he advises is simple and effective. The stockings are changed twice daily, and the stocking-feet placed for some hours in a saturated solution of boracic acid: they are then dried and are again fit for wear. Cork soles should be used, as the leather in the bottom of the boots also smells badly. Several pairs of these soles should be kept in use, and treated in the same way as the stockings. In *Pruritus Pudendi* boracic acid is an excellent remedy according to Dr. A. Wiltshire,[5] but from its small solubility in water, is not so handy as borax. *To Boils*, Dr. Garrigues used the following with the most satisfactory results:—Powdered Boracic Acid ʒj., Vaseline ʒv., Benzoin Powder gr. vijss. M. It was from the striking relief which Professor Lister obtained from a solution of boracic acid in *Onychia attended with fetid discharge*, from which he was suffering, which led him first to turn his attention to it as an antiseptic agent. It is well worthy of further trials in those cases. Dr. W. Easby[6] states that he has found boracic ointment alone do wonders with *Ulcers*, but with the addition of iodoform sprinkled on the sore much more can be done. *For Phagedœnic Chancres*, after the separation of the eschar, a saturated solution of boracic acid is often very useful. (Hill and Cooper, p. 487.)

487. *In Chronic Suppuration of the Middle Ear*, boracic acid in impalpable powder has been strongly recommended by Drs. Berold, Becker, and Cassells. Dr. R. Sinclair[7] has tried it largely in two ways—(1) blowing it in by the powder-blower, and (2) packing the meatus thoroughly, as advised by Dr. Cassells. In the slighter cases he says he frequently obtained good results, but in the more severe the treatment was prolonged and tedious. He adds that though he has by no means abandoned boracic acid, his first hopes of it have not been realized.

488. *In Conjunctival Inflammation and Irritation*, a solution of

[1] Lancet, Aug. 24, 1878.
[2] Brit. Med. Journ. June 24, 1882.
[3] Med. Press, Oct. 4, 1882.
[4] Brit. Med. Journ. Sept. 18, 1880.
[5] Brit. Med. Journ. March 5, 1881.
[6] Brit. Med. Journ. March 6, 1880.
[7] Edin. Med. Journ. June 1881.

the acid (from gr. v. to ʒj. up to saturation) is much used by some oculists as a disinfectant and soothing eye-wash. (Wood, p. 636.)

489. Boroglycerid is prepared by saturating hot glycerine with Boracic Acid. It was recommended by Professor Barff in 1882, in a lecture delivered before the Society of Arts, as a preservative of meat. Subsequently it has been used in surgery and medicine as an antiseptic dressing, and in the treatment of various infective diseases.

490. *Therapeutic Uses. Abscesses, &c.* Mr. Barwell[1] employs a water solution (1 in 20) for injecting *Abscesses*, and as a surgical dressing. Mr. Lediard,[2] writing upon boroglycerid as an *antiseptic dressing* in surgery, concludes: "For *Open Wounds* it is non-irritating and powerfully antiseptic. For *Wounds where pus is pent up* or can accumulate, *e.g.*, in stumps, &c., it fails to keep the pus sweet. He failed to obtain healing by first intention, or to keep down the temperature.

491. *Cystitis.* Mr. H. A. Latimer[3] used watery injections with marked success.

492. *Purulent Ophthalmia.* Mr. Hartridge[4] used lint soaked in Boroglycerid (1 in 20) for an eye-pad, while the lids were constantly bathed with a solution of strength of 1 in 40. He further brushes the conjunctival surface of the lids with cotton-wool soaked in boroglycerid (1 in 10).

Borax. See Sodæ Biboras.

493. Bromum. Bromine. A liquid non-metallic element, obtained from sea-water, and from some saline springs.

Med. Prop. and Action. Externally it acts as a strong caustic by virtue of its oxidizing property. The vapour, when inhaled, produces a sensation of intense irritation; coryza, laryngitis, and bronchitis even, may follow its inhalation, while in some cases anosmia occurs. This irritant action is said[5] to be due to ozone being generated and attacking the moist mucous membrane. It is seldom given internally; its use having been followed by gastro-enteritis and catarrh. The kinship between iodine, bromine, and chlorine points to its probable action upon the glandular systems and its antiseptic powers. In combination it occurs as bromides, a group of bodies possessing highly important physiological and therapeutic relations. See under heading of the metals. It is best administered in combination with bases—*e.g.*, the bromides of ammonium, potossium, and sodium (*q.v.*). See also Hydrobromic Ether.

494. *Therapeutic Uses. In Scrofula*, bromine is highly spoken of by M. Bonnet and others. Dr. Glover, indeed, regarded it as superior to iodine, but experience has failed to establish its claims as a constitutional remedy in this disease, and it has fallen into disuse. Besides some cases of *Scrofulous Enlargements and Scrofulous Ulcers*, Dr. Glover mentions cases of *Eczema and Carbuncle* which recovered under its internal and external use. Bromine has

[1] Lancet, 1882, p. 775.
[2] Lancet, 1882, p. 842.
[3] Brit. Med. Journ. 1884, p. 644.
[4] Lancet, Feb. 1883.
[5] Harveian Prize Essay, 1842.

been used as a disinfectant. Mr. Goldsmith,[1] of the United States army, found the following solution useful as a local application in *Hospital Gangrene, Erysipelas, and Sloughing Sores*:—℞ Bromine ʒj.; Bromide of Potassium gr. clx.; Distilled Water fʒiv. M. He employed the same solution as a prophylactic in wards in which *Erysipelas* had appeared, and he found the inhalation of the vapour of service in *Diphtheria*. *In Cancer of the Uterus*, a solution of bromine in spirit is preferred by Dr. Routh[2] to all other caustics. *In Cancerous Tumours of the Uterus and elsewhere*, Dr. Wynn Williams[3] obtained excellent results from injections of bromine, using for the purpose a solution of ♏xij. in rectified spirit.

495. Buchu Folia. Buchu.

Med. Prop. and Action. Tonic, diaphoretic, and diuretic. It exercises a peculiarly soothing effect on the genito-urinary organs, whilst its tonic operation is manifested by the returning strength and increased appetite of the patient. To obtain its beneficial effects, the medicine requires to be persevered in. *Active principles*, a volatile oil and a bitter extractive, *diosmin*.

Dose:—*Of the powdered leaves* (a bad form of administration) gr. xx.–xl. *Of the infusion* (Buchu leaves, ʒss.; boiling water, fl. ʒx.), fl. ʒj.-iv. twice or thrice daily. *Of the tincture* (Buchu leaves, ʒijss., proof spirit Oj.), fl. drm. j.-ij.

496. *Therapeutic Uses. In Affections of the Bladder depending upon Disease of the Kidneys*, Sir B. Brodie states that he has seen it productive of the most beneficial effects. It requires to be persevered in, and should be combined with alkalies or acids, as may be indicated by the state of the urine.

497. *In Irritable States of the Bladder*, accompanied by highly acid urine and frequent desire to micturate, few combinations are more useful than one of Infusion of Buchu, Liq. Potassæ, T. Hyoscyami and Mucilage.

498. *In Cystitis*, it proves serviceable, but in order that it should do so, Sir H. Thompson (p. 151) considers that the infusion should be carried to the extent of half a pint daily. *Renal Affections* are often remarkably benefited by a persevering use of this remedy.

Cacao Butter. See Theobromæ Oleum.

Caffeine. See Coffea Arabica.

499. Cajuputi Oleum. Oil of Cajuput.

Med. Prop. and Action. Diffusible stimulant, antispasmodic, and diaphoretic. When taken internally, it causes a sensation of warmth in the stomach, excites the action of the heart and arterial system, and subsequently induces copious diaphoresis. Externally, either alone or combined with equal parts of soap, liniment, or olive oil, it is a useful rubefacient and stimulant embrocation. It is a medicine of much power and value, and one too much neglected in

[1] American Med. Times, 1863.
[2] Brit. Med. Journ. Feb. 19, 1870.
[3] Lancet, Aug. 12, 1871.

general practice. Mr. Mayo Robson[1] has called attention to it as an antiseptic. His idea is, that instead of applying antiseptics locally, by spray or otherwise, to recent wounds, in operations, &c., it is preferable and more effectual to establish an antiseptic atmosphere in the patient's chamber or operating-room, and he instituted a series of experiments which seem to prove that in the vapour of cajuput, eucalyptus, and other volatile oils, we have powerful antiseptics which at ordinary temperatures may so saturate the air as to kill all infective particles; perhaps not only bacteria and micrococci, but also the germs of fevers and other infectious diseases. See EUCALYPTUS GLOBULUS.

Dose:—Of the oil, ♏j.–v. *Of the spirit* (Oil of Cajuput fl. ℥j., Rect. Spirit fl. ℥xlix.), fl. ℥ss.–j.

500. *Therapeutic Uses.* *In Gout and Rheumatism* much benefit follows the external and internal use of cajuput oil. *In Retrocedent Gout* it is particularly serviceable, in doses of gutt. v.–vj., frequently repeated. *In Lumbago and other forms of Chronic Rheumatism*, Dr. Fuller advises the following embrocation:—℞ Ol. Cajuputi ℥v., Ol. Terebinth. ℥v., Lin. Ammon. vel T. Aconiti ℥vj. M. Lin. Aconiti (B. Ph.) may be substituted for the T. Aconiti. Sometimes T. Arnicæ (℥iv.) may be advantageously added, but care is necessary, as a troublesome eruption is apt to result where its use is long persevered in. *In Neuralgic Affections* also it is occasionally of great service. It is said to relieve the pain of *Dysmenorrhœa*.

501. *In Flatulence and Flatulent Colic*, immediate relief often attends the exhibition of cajuput oil, in repeated doses of gutt. iij.–v.

502. *In Toothache*, a small piece of cotton, saturated with cajuput oil, and introduced into a carious tooth, is stated to be an efficacious remedy.

503. *In Sprains, Contusions, and to Paralytic Limbs*, an embrocation of cajuput oil, diligently rubbed in, has been found useful in stimulating the parts and relieving pain.

CALAMINA PRÆPARATA. Calamine. See ZINCI CARBONAS.

504. CALCII CHLORIDUM. Chloride of Calcium. Called also the Muriate and Hydrochlorate of Lime.

Med. Prop. and Action. In small doses, the chloride of calcium is stimulant, increasing the action of the secreting organs; if long continued, it appears to act specifically upon the lymphatic glandular system, causing the reduction or absorption of glandular and other tumours. In large doses, it acts as an acro-narcotic poison, ℥iijss. proving fatal to a dog in six hours. It should always be commenced in small doses, increased with caution, and immediately discontinued if it produce nausea. Dr. Begbie regards the solution of the old Edin. Ph. as the best form of administration (℥viij. of the crystallized chloride in Aq. Destil. ℥xii.), of which he prescribes gutt. xv. for adults, and gutt. iij.–x. for children, thrice daily, at or near mealtimes. The best vehicle is milk, the next best syrup.

Dose:—gr. x.–xx. for adults, gr. ij.–iij. for children, in aqueous solution *(ante)*.

505. *Therapeutic Uses.* *In Scrofula*, this salt, under the name of muriate of lime, was held in high esteem by Dr. Beddoes and other

[1] Brit. Med. Journ. Oct. 15, 1881, and Sept. 2, 1882.

early writers, but it fell into apparently unmerited disuse, for the recorded experience of Dr. Warburton Begbie,[1] Dr. S. Coghill,[2] and Dr. R. Bell[3] leave no room for doubt that in it we possess a powerful remedy in *Chronic Glandular Enlargements*, *Tabes Mesenterica*, and other manifestations of a scrofulous diathesis. *In Scrofulous Cachexia*, it proves of the greatest use. In children, when the sleep is restless and troubled, the breath fetid, the tongue coated and foul, the tonsils enlarged, the stools irregular, offensive, and deficient in bile, Dr. Coghill states that he knows no remedy approaching it in value. *The Colliquative Diarrhœa* which so often accompanies this condition, and above all that obstinate lientery which is seen with hypertrophy of the mesenteric glands, yield to the chloride like a charm. In pronounced *Tabes Mesenterica* it is equally efficacious (Coghill). As Dr. Begbie points out, it may be weeks or even months before the glandular swellings are visibly affected, and the remedy requires to be continued for a considerable time after the entire disappearance of the cervical fulness. Cod liver oil may be advantageously prescribed simultaneously.

506. *In Phthisis*, Dr. Sawyer[4] speaks highly of the value of the chloride in ten-grain doses daily in water, glycerine, and milk immediately after meals: it tends, he states, to check night sweats, to cause increase of weight, and to dry up pulmonary lesions. It might also prove useful in arresting attendant diarrhœa. Its taste is so nauseous that many patients refuse it.

507. *In the Diarrhœa of Enteric Fever*, Dr. Coghill (*op. cit.*) has found the chloride most useful. He states that turpentine stupes to the abdomen, and the solution of the chloride in milk internally, is the treatment he has long trusted to in the milder uncomplicated forms of typhoid fever.

508. *In Chronic Skin Diseases*, especially in *Lupus*, *Eczema*, and *Impetigo*, it is well spoken of by Cazenave,[5] in doses of gr. xv.–xxx. daily, in some vegetable infusion.

509. *In Fibrous Tumours of the Uterus*, Dr. M'Clintock, following Dr. Rigby's recommendation, gave an extended trial to chloride of calcium (ɱxxx.–xl. Liq. Calcii Chlor., Dub. Ph., thrice daily in a bitter infusion), and in one instance its prolonged use was followed by a complete cure. (Dr. Graily Hewitt, p. 558.) Dr. Tilt (p. 340) advises that its administration should be watched, for its long-continued exhibition in young subjects, he remarks, has been known to cause arcus senilis and other evidences of arterial degeneration. He prescribes it in doses of gr. x. twice daily. Sir Spencer Wells states that it has appeared to him to be very useful in these cases by leading to atheroma or calcification of the nutrient vessels of these growths. Its use is not therefore unattended with danger; if this calcification of the arteries was limited to those supplying the tumour, the chloride might be a valuable remedy, but it is not so; it acts in a similar way on the vessels of the body generally,

[1] Edin. Med. Journ. July 1872, and Coll. Works, p. 307.
[2] Practitioner, Oct. 1877.
[3] Lancet, Aug. 25, 1877.
[4] Brit. Med. Journ. June 1880.
[5] Provincial Journ. April 2, 1851.

and this brings about a condition more dangerous than the one for the cure of which it was given. (Dr. J. Williams, "Syst." v. p. 764.) Its use should always be suspended during the menstrual period. *In Non-malignant Tumours of the Ovaries*, it is recommended by Dr. Seymour.

510. CALX CHLORATA. Chlorinated Lime. Chloride of Lime; called also Hypochlorite of Lime, Bleaching Powder. Obtained by exposing slacked lime to the action of chlorine gas as long as the latter is absorbed.

Med. Prop. and Action. In doses of gr. j.–v.–vj. in solution, it has been employed as a stimulant. It is also used as a lotion (gr. lx.–ʒss., Aq. Oj.), ointment (gr. xx.–gr. lx., Adipis ʒj.), gargle (gr. cxx. Aq. Oj., filter and add honey ʒj.), an enema (gr. x.–xv. in solution), with a view of correcting the fetor of discharges, and stimulating the parts to which it is applied to a more healthy action. In most cases it is very effectual in fulfilling both these indications. It is the best antidote in *poisoning by sulphuric acid, sulphide of ammonia, sulphide of potassium, and hydrocyanic acid;* it should be given internally if practicable, and the vapour should be inspired. As an antiseptic and disinfectant, it is a valuable agent; its power of destroying bad odours renders it particularly useful in hospitals, jails, sick chambers, and dissecting rooms. For this purpose a solution may be sprinkled thickly over the floor and walls, or cloths wrung out in the solution may be hung in the room; chlorine gas is slowly evolved. Or the solution may be placed in a saucer, and a small portion of dilute hydrochloric acid, or even a solution of common salt, may be added to it. This causes a rapid evolution of chlorine gas. Its power of arresting the progress, or of destroying the infection of diseases, is not well established; but its deodorizing property renders it invaluable when any infectious disease exists; and it may thus *indirectly* prove in some cases a disinfectant. (See CHLORINE.) It is, however, inferior to carbolic acid.

Dose:—Of Chlorinated Lime, gr. j.–v., largely diluted. *Of the Solution* (Liq. Calcis Chloratæ), ♏xx.–xxx., diluted. Chiefly used as a disinfectant and deodorizer. *For Inhalation*, moisten 2 oz. of the chloride with cold water in a suitable vessel.

511. *Therapeutic Uses. In Cancrum Oris*, Rilliet and Barthez speak highly of the dry chloride of lime, applied with the point of the finger to the ulcerated surface. The mouth should be well washed out a few seconds after each application. When cicatrization commences, a gargle, composed of 1 part of the chloride, 30 of mucilage, and 15 of syrup, is recommended by the same authors.

512. *In Scorbutic and other Ulcerations of the Mouth, and in Ptyalism*, a gargle composed of chlorinated lime gr. cxx.–gr. ccxl., water Oj., and honey ʒj., is very useful in correcting the fetor, and stimulating the parts to healthy action. The solution should be filtered before adding the honey.

513. *In Fetid Discharges from the Uterus, Vagina, or Rectum*, an injection composed of gr. lx.–gr. cxx. of the chloride, in Oj. of water (filtered), proves highly useful, by its deodorizing influence. It may be used either warm or cold, and should not be of sufficient strength to cause pain. The same injection also proves serviceable *in Fetid Discharges from the Ears and Nostrils.*

514. *In the Purulent Ophthalmia of Infants*, Dr. Pereira states

that he has found a weak solution of the chloride very successful. *In the Purulent Ophthalmia of Adults*, it has also been used with benefit.

515. *In Erysipelas*, a solution of the chloride (gr. lx.–gr. cxx., Aq. Oj.) has been found very serviceable as a lotion. The parts should be kept constantly wetted with it. Sir E. Wilson (pp. 247, 367) advises it in *Ecthyma*, and also to correct the unpleasant smell of the cutaneous secretion in *Osmidrosis*.

CALCIS HYPOPHOSPHIS. See SODÆ HYPOPHOSPHIS.

516. CALCIS LIQUOR. Solution of Lime. Aqua Calcis. Lime Water is thus prepared :—Take Slaked Lime 2 oz., Distilled Water 1 gallon. Introduce the lime into a stoppered bottle containing the water, and shake well for two or three minutes. After twelve hours the excess of lime will have subsided, and the clear solution may be drawn off with a syphon as it is required for use, or transferred to a well-stoppered green glass bottle.

Med. Prop. and Action. Antacid, lithontriptic, and astringent. Milk is the best vehicle for its administration. In large or long-continued doses, it occasions thirst, constipation, and derangement of the digestive organs. It renders the urine alkaline. Unlike other alkalies, it diminishes the action of secreting organs, and hence has been termed astringent. Externally it is applied to ulcers, cutaneous affections, &c.

Dose:—*Of Liquor Calcis* fl. ℥ss.–iv. For external use the LINIMENTUM CALCIS (Solution of Lime, Olive Oil āā fl. ℥ij.), formerly known as Carron Oil, is a valuable application in burns, &c.

517. *Therapeutic Uses. In Acidity, in Cardialgia*, and *in Dyspepsia arising from or connected with Acidity of the Stomach*, lime water, in doses of fl. ℥jss.–fl. oz. ij., is often speedily and permanently effectual. It is particularly useful in dyspepsia occurring in persons whose urine shows a strong acid reaction, and when vomiting is a prominent symptom. It is best given in milk. Milk with lime water has also been found of great service as an article of diet in *Ulcer of the Stomach*.

518. *In Diarrhœa depending upon Acidity*, lime water may be given with manifest benefit. In these cases, mucilage is the best vehicle. It is especially of use in the diarrhœa of infants and young children, and is administered with the best effect when purging and acidity result from artificial feeding. A sixth or fourth part of lime water may be added to each pint of milk. *In Chronic Dysentery*, used in the form of enema, it proves useful in some instances. It may also be given by mouth.

519. *In many forms of Vomiting*, lime water often acts very promptly; it appears to have far less influence on sympathetic vomiting than in that connected with functional derangement of the stomach. It will sometimes succeed when hydrocyanic acid and other remedies fall. It has even been found efficient in the *Vomiting of Yellow Fever;* the reports of its efficacy are very encouraging. Dr. Hosack used it most successfully combined with

milk, and with porter when milk could not be retained. Dr. Macdonald (" Syst." i. p. 675) considers that more stress ought to be laid on the importance of this agent.

520. *In Pruritus Pudendi*, an effectual removal of the distressing symptoms is occasionally effected by the topical application of tepid lime water, together with perfect rest and light clothing. The following formula, advised by Dr. Finny[1] for *Eczema Genitalium*, seems likely to be useful:—℞ Lin. Calcis ℥iv., Ext. Bellad. gr. xii., Zinci. Oxid. ʒij., Glycerini ʒj., Aq. Calcis ℥iv. M. To be applied at night after bathing the part in very hot water. During the day, dust with a powder composed of bicarbonate and oxide of zinc and starch. *To prevent Pitting in Small-pox*, Dr. J. Bell[2] recommends the application of cotton wool soaked in Lin. Calcis. He speaks highly of its efficacy.

521. *In Croup and Diphtheria*, lime water is considered to possess the power of dissolving the pseudo-membranes; hence its local use has been advocated by Dr. Geiger of Philadelphia, and Dr. Biermar. Dr. Beigel[3] employed it in several cases, in one of which it afforded relief when other inhalations had proved fruitless. It is used in the proportion of 1 part to 30 parts of water, each inhalation lasting about a quarter of an hour, and repeated every two hours as long as bad symptoms are present. It is best applied in the form of spray by means of a suitable apparatus,

522. *In Scarlet Fever, when Coryza is troublesome* and the discharge thin and acrid, Dr. Hillier (p. 317) advises syringing the nostrils with lime water, or with a solution of common salt (ʒj. ad Aq. ℥ij.), or when the secretion is tenacious, with soap and water.

523. *In Cancer of the Uterus*, Dr. Dewees speaks favourably of lime water as a palliative. He advises it, a little warmed, to be thrown up into the vagina by a syringe, several times a day.

524. *In Leucorrhœa and Gleet*, an injection of a weak solution of lime water occasionally effects a cure when other remedies fail.

525. *In Scrofula*, lime water is sometimes productive of benefit. Dr. Shapter states that, taken with milk to the extent of f. ℥ss., three or four times a day, it has in his practice in many cases been of the most eminent service, especially in scrofula of long standing, where gland after gland becomes the seat of abscess and ulcer. *In Scrofulous Ulcers*, Dr. Pereira states that he frequently employed lime water as a wash, and that, in many instances its power of checking excessive secretion was most marked. *In Phthisis*, lime water and milk has been strongly recommended by Dr. T. K. Chambers and others as an ordinary beverage.

526. *In Burns and Scalds*, there are few local applications more generally useful or efficacious than Linimentum Calcis. Linseed,

[1] Braithwaite, vol. lxxxiv. p. 247.
[2] Glasgow Med. Journ. June 1861.
[3] Practitioner, Aug. 1868.

or other oils, may be substituted for olive oil, should the latter not be available.

527. *In Poisoning by the Mineral and Oxalic Acids*, lime water acts as an antidote.

528. *In Tinea Capitis, and other Cutaneous Diseases* with profuse discharge, lime water proves useful as a stimulant and astringent wash. *In Ephelis and Freckles*, Sir E. Wilson derived benefit from a liniment composed of equal parts of lime water and olive oil, with a small quantity of Liquor Ammoniæ.

529. *In Ascarides*, injections of three or four ounces of lime water have been recommended by Dr. Price, of Margate. He has found two or three repetitions sufficient in the most obstinate case.

530. CALCIS LIQUOR SACCHARATUS. Saccharated Solution of Lime.

Slaked Lime ʒj., Refined Sugar ʒij., Distilled Water Oj. Dose, ♏xx.

CALCIS SACCHARAS. Saccharate of Lime.

Consists of Quicklime ʒviij., rubbed up with Refined Sugar ʒv., and Distilled Water Oj.

Each ounce by weight should contain 18 grains of lime. Under the same name M. Béral proposed a preparation formed by saturating simple syrup with lime and filtering—a much stronger formula than that above mentioned, and less generally applicable.

Med. Prop. and Action. The solubility of lime in water is increased by the sugar. These preparations are therefore valuable when it is desirable to administer lime in full doses. *The Medical Action and Therapeutic Uses* of saccharate of lime are thus summed up by Dr. Cleland:—"It is, of course, a powerful antacid, and probably the best we have, since it is stronger and pleasanter than magnesia, and does not weaken the digestion like the alkalies. Far from doing so, its most important use is as a tonic of the alimentary system in cases of *Obstinate Dyspepsia*. As such, its action is more powerful than that of the vegetable stomachic tonics. It is suitable for cases with too little, as well as for those with too great, secretions of gastric juice. It seems particularly serviceable in *Gouty Constitutions*. In dyspepsia of hysterical and anæmic cases, it does not seem to be of much use. The best period for taking it is after meals. So far from causing constipation, it is a very valuable means of overcoming gradually the *Chronic Constipation* which so frequently accompanies dyspepsia; and persons who for years have been in the constant habit of using aperient medicines, have been able to abandon them, in a great measure, after taking this remedy for some time. It will also be found serviceable in checking *the Diarrhœa of Disordered Digestion*, acting as lime water does; only that the latter is so dilute that it is often impossible to administer it to adults in the quantity desirable. It may be found useful also in *allaying the cravings of the intemperate*." In a subsequent paper Dr. Cleland[1] calls attention to the value of saccharated lime in *Bilious and Gouty Diarrhœa* and *British Cholera*, which was found to yield rapidly to its use in large doses copiously diluted; and given with milk as an ordinary drink, he states that he has derived great benefit from it in *Typhus Fever;* it was found specially useful in cleansing the mouth, removing sordes, and allaying thirst. It certainly may prove a valuable adjunct to other treatment. Large doses and copious dilution are two points which Dr. Cleland insists upon in the use of this preparation. *In the Chronic Diarrhœa of Children* the saccharate was used successfully by Trousseau and Pidoux (ii. p. 382), who state that they have been in the habit of adding ten grains of it to each quart of milk intended for the supplementary

[1] Practitioner, Dec. 1875.

diet of children at the breast, that the milk is thus kept from becoming speedily sour, and thereby the tendency to cause diarrhœa is diminished.

Dose.—mxv.–f3ss. or f3j., or more, copiously diluted.

531. Calcis Phosphas. Phosphate of Lime.

Med. Prop. and Action. Alterative and antacid. From the researches of Dusart and Blache[1] it appears to be nearly insoluble in the gastric juice, and consequently unfitted except in a very slight degree for becoming assimilated. Hence they were led to prepare, by the action of lactic acid upon it, a new salt which they designate Lacto-phosphate of Lime, which is perfectly soluble in water and all the gastric fluids, and can consequently be readily assimilated. It should be taken at mealtime, so as to get thoroughly mixed with the food.

Dose of the Phosphate and Lacto-phosphate of Lime, gr. x.–xx. Syrup is the best vehicle.

532. *Therapeutic Uses. In Scrofulosis*, especially in *Scrofulous Ulcers* and *Tubercular Diarrhœa*, Dr. Beneke[2] obtained marked and satisfactory results from the phosphate as a palliative. *In Phthisis*, Dr. H. Blanc,[3] of Paris, obtained great benefit from the combined use of the phosphate and the juice of raw meat.

533. *In Rickets* it has been administered, on the theory that this disease arises from a deficiency of lime in the system; but the treatment has not been always found successful. Dr. Budd, however, reports very favourably of the practice. He prescribes gr. v.–x. in chalk mixture thrice daily, adding a chalybeate if anæmia is present. He believes that the deterioration in the teeth of children is due to the insufficient supply of inorganic constituents of these organs in the food, and suggests, as an article of diet, biscuits containing a portion of the phosphate. It may be advantageously combined with cod-liver oil. *In promoting the Formation of Callus in Fractured Bones*, the evidence of M. Milne-Edwards, whose experiments were performed on animals, is decidedly favourable to the internal administration of the phosphate. He believes that it may be usefully employed as an adjuvant—expediting the union in ordinary fractures, and tending to prevent non-consolidation in others. M. Gosselin also speaks favourably of its use in minimum doses of gr. vijss. daily. Dr. Phillips (p. 523) states that he has certainly found the phosphates very beneficial in *Caries* and *Joint Disease*.

534. *In the Anœmia of young rapidly growing persons*, and *in Debility dependent on Over-work, Over-lactation*, also in *Profuse Discharges such as are met with in Leucorrhœa, Chronic Bronchitis, Large Abscesses*, &c., Dr. Ringer (p. 213) bears strong testimony to the value of the phosphate. His remarks are well deserving of careful perusal.

535. *In Adynamic (Typhus and Typhoid) Fevers*, and in *Convalescence after Acute Diseases*, Dr. R. Blacke[4] used the Lacto-phosphate with the best effects during the siege of Paris, and pronounced it at once an aliment, an article of food, and a medica-

[1] Ranking's Abstract, liii. (1871) p. 170; also Dusart, Practitioner, May 1879.
[2] Lancet, April 19, 1851.
[3] Lancet, June 13, 1874.
[4] Practitioner, Feb. 1872.

ment of the highest value. He prescribed it in the form of syrup (Dusart's) in doses of 3 or 4 tablespoonfuls daily, taken at meals.

536. *In the Sickness of Pregnancy*, Mr. Metcalfe Johnson[1] reports highly of the efficacy of the phosphate in doses of gr. iii.–x. thrice daily, suspended in water. Dr. Beneke (*op. cit.*) considers that by its use during *Pregnancy* women who have hitherto borne only sickly and scrofulous children will bring forth healthy offspring.

537. Calcii Sulphidum. Sulphide of Calcium.

Med. Prop. and Uses. Prof. Ringer[2] has called attention to the sulphides of potassium, sodium, and calcium, notably the last named, as agents influencing the suppurative process in a marked and manifest manner, arresting the formation of pus in some instances when given early, and controlling its course in others. He lauds it in doses of gr. $\frac{1}{4}$ every hour or two or three hours.

538. *Therapeutic Uses.* In *Boils* and *Carbuncles*, in *Scrofulous and other unhealthy Ulcerations*, such as occur in children, also in *Scrofulous Glandular Enlargements* and *Indolent Abscesses*, it has been used with success (see Ringer's Handbook, pp. 134–141). Dr. Phillips (p. 37) also speaks favourably of its action, having frequently used it with advantage in simple *Abscess* and in *Tonsillar Abscess* (*Quinsy*); and in *Mammary Abscess*, when the time for antimony and belladonna is past, he speaks of it as "quite the best remedy." He likewise recommends it in *Scrofulous Ophthalmia* and *Scrofulous Otorrhœa*, and indeed in almost all *Purulent Discharges of Childhood*, especially when these are becoming fœtid and obstinate.

539. *In Scrofulous Ophthalmia*, including under this term *Phlyctenular and Pustular Conjunctivitis and Keratitis*, the sulphide has proved most useful in the hands of Mr. S. Snell.[3] He gave it in doses of gr. $\frac{1}{10}$ to $\frac{1}{4}$, with a few grains of sugar of milk, thrice daily.

540. *In Acne, Sycosis* and other *Skin Diseases*, especially in those which present a considerable pustular element, Dr. Bulkley[4] speaks highly of the sulphide. In *Hordeolum* he found it very valuable; also in *Furunculus*, relieving not only the symptoms, but preventing crops of boils. Like testimony, he adds, may be given in *Carbuncles* and *Suppurating Buboes;* he prescribed it in gr. $\frac{1}{4}$ doses. It is a very unstable salt, hence he directs care to be taken that it possesses its characteristic smell of sulphuretted hydrogen.

Calomel. See Hydrargyri Subchloridum.

541. Calumbæ Radix. Calumba Root.

Med. Prop. and Action. A pure bitter tonic and stomachic. It is a very mild and valuable tonic, and is, in most cases, easily retained on the stomach, when the more powerful vegetable bitters are rejected. It gives rise to little, if any, arterial excitement, and does not cause constipation. As it contains neither tannic nor gallic acids, it may be given in combination with the salts of iron. The infusion requires to be freshly prepared daily, as, in consequence of the large proportion of starch which it contains, it rapidly decomposes. It contains a non-nitrogenized crystallizable principle, *Calumbine*, which is but slightly soluble in water or proof spirit; an alkaloid, *Berberine;* and an acid, *Calumbic Acid.*

[1] Med. Times, July 1, 1871.
[2] Lancet, Feb. 21, 1874.
[3] Practitioner, Jan. 1882.
[4] Practitioner, Feb. 1881.

542. *Therapeutic Uses. In Affections of the Stomach* requiring vegetable bitter tonics, calumba is one of the best; it allays irritation, and strengthens the digestive organs, increases the appetite, and gives tone to the system generally. *In Atonic Dyspepsia*, the infusion may be given at a far earlier period than other remedies of the same class. *In many forms of Vomiting, particularly in that of Pregnancy*, it has been found in some cases to succeed; its efficacy, however, is greatly increased by combination with sedatives, especially hydrocyanic acid. *In Ulcer of the Stomach*, according to Dr. Brinton (p. 171), the vomiting, painful nausea, and flatulence, may often be relieved by a combination of infusion of calumba, iodide and bicarbonate of potassium.

543. *In Debility and Convalescence after Fevers, or when the Stomach remains irritable*, calumba is especially indicated, and often proves very useful. It may be given in infusion, or the tincture ℥xxx.–xl. may be added to an ordinary effervescing draught. As a tonic it is peculiarly adapted for the puerperal state and for childhood.

544. CAMBOGIA. Gamboge. A gum resin.

Med. Prop. and Action. Hydragogue cathartic and anthelmintic. It often causes violent vomiting and griping, but this may be in a great degree obviated by combining with it soap, the carbonate of potash, rhubarb, or calomel; or by giving it in a liquid form, properly diluted, or in a state of minute subdivision. When taken internally, it becomes absorbed into the system, and communicates its colouring principle to the urine, the quantity of which secretion it also increases. It may be advantageously given either in the form of the Compound Gamboge Pill, or Gamboge ʒss., Carb. of Potash ʒj., Alcohol fʒxij. Macerate for a week. Dose, ℥xl.–fʒj. in a convenient vehicle.

Dose of Gamboge:—In powder gr. j.–iv. *Of the Compound Gamboge Pill*, gr. v.–x.

545. *Therapeutic Uses. In Dropsical Affections*, gamboge, from its powerful hydragogue cathartic property, often proves serviceable. Christison[1] speaks highly of it. He states that he has found gamboge act in these cases with great force, both in occasioning free watery evacuations and in reducing the dropsy, yet without any particular tormina, exhaustion, or other uneasiness being occasioned, although administered once every two days, or even daily. He advises it in doses of gr. v.–vij., or even ix., every other day, finely powdered, and combined with cream of tartar. Of all hydragogues, he regards gamboge as the most certain and the most easily managed.

546. *In Obstinate Constipation*, especially in that arising from torpor of the colon, the compound gamboge pill, in doses of gr. v.–viij., every day or every other day, is stated to be very efficacious. It may be advantageously combined with equal parts of Pil. Coloc. Co.

547. *In Cerebral Affections*, when it is desirable to produce revulsion from the brain, the compound gamboge pill, in combination with calomel, will often be found to fulfil this indication. It is inadmissible, however, when the vital powers are greatly depressed, or when great debility is present.

1 On Granular Diseases of the Kidneys, pp. 152–4.

548. *Against Tænia, or Tape-Worm,* gamboge in small repeated doses has been employed as an anthelmintic, but it acts thus solely in virtue of its purgative properties; it exercises no specific influence on the entozoa, hence it has been superseded by male-fern, kamala, and other tænicides of acknowledged power.

549. CAMPHORA. Camphor. A concrete volatile oil.

Med. Prop. and Action. In doses of gr. ij.–v.–x. camphor acts as a stimulant; it increases the action of the heart and arteries, exhilarates the spirits, excites warmth of body and diaphoresis; the pulse is rendered softer and fuller. These effects are very transitory, and are followed by depression. In somewhat larger doses, it allays spasm and pain, and induces sleep. These statements stand in great measure opposed to those of Dr. John Harley,[1] who concludes from his researches on the action of camphor that in ordinary medicinal doses, up to five grains, it produces no physiological effects whatever; indeed, in one case treated by him no dose less than fifteen grains produced any appreciable effect. Commencing with gr. iv. he gradually increased it to gr. xxx., and in one instance to gr. xxxv., without any serious or lasting ill effects. Should Dr. Harley's observations be confirmed by future inquirers, the conclusion will be inevitable, that much that has been recorded on the therapeutic uses of camphor is visionary, or that the benefit observable in certain cases has been mainly due to the agents with which it has been conjoined. In the meantime the subject must be regarded *sub judice.* In larger doses, according to Binz (p. 73), it causes a distinct but transitory fall of temperature, not only in the healthy subject, but still more so in those suffering from fever of septic origin. Prof. Christison (p. 257) points out that camphor taken largely in coarse powder is apt to occasion gastric pain, nausea, and vomiting, proving fatal, with symptoms of irritant poisoning; but that when taken in a state of fine division or solution, large doses excite little else than narcotic symptoms, such as giddiness, staggering, obscurity of vision, confusion of ideas, and delirium—a state, in short, which considerably resembles intoxication, is attended with increased frequency of pulse, and ends in stupor, interrupted by occasional convulsions. It acts chiefly on the nervous system; and, like sulphur, it transudes through the skin, and is exhaled by the lungs. Camphor is an extremely diffusible stimulant, being rapidly extended over every part of the system, and disappearing sooner than any other narcotic. When it is desired to exert a stimulant influence, it should be given in small doses, frequently repeated. When its sedative effects are required, it should be administered in large doses, and at long intervals. It exercises a powerful influence on the genito-urinary system, and is regarded as anaphrodisiac; occasionally it causes strangury, yet by some it has been advised to relieve the strangury produced by cantharides. It has also been recommended as an antidote in poisoning by opium. Externally, dissolved in oil, it forms a valuable anodyne embrocation. It is a common ingredient in tooth-powders, but it is stated, perhaps without sufficient reason, that its continued use in this way renders the teeth brittle. Binz (p. 73) points out that camphor powerfully arrests the decomposition of organic substances dependent on protoplasmic ferments.

Dose:—Of Camphor, gr. x. in the form of pill, or suspended in mucilage.

550. *Modes of Administration.* In addition to the above, camphor has been used in a variety of ways; thus, the fumes of it are inhaled in the early stages of *Coryza* and *Catarrh,* and it is said with considerable benefit. Dissolved in chloroform (3 of camphor to 1 of chloroform), it is sometimes sold under the name of "*Soluble Camphor.*" Finely powdered, it is either incorporated with other fine powders, or it is applied directly, sprinkled over the surface of a

[1] Practitioner, Oct. 1872.

poultice for the relief of local pain. *Raspail's "Eau Sedative"* is another form for external use (℞ Solution of Ammonia, 100 parts, Water 900 parts, Common Salt 20 parts, Camphor 2 parts, Oil of Roses q.s. M.) It is held by many in considerable repute. Lastly, it may be used in the form of vapour bath. The patient is to be covered with a blanket, which should be pinned close to the throat, and camphor (℥ss.–℥j.) placed on a heated plate within the blanket. In a few minutes it produces profuse perspiration. Care should be taken to protect the eyes from the vapour, as it is apt to cause great irritation of those organs.

551. *Therapeutic Uses. In Typhus, Typhoid, and other Adynamic Fevers*, especially in the advanced stages, when there is great prostration of vital power, sleeplessness, stupor, low muttering, delirium, &c., camphor, conjoined with various stimulants, sedatives, &c., is a time-honoured remedy; but as it has rarely, if ever, been given alone, it is difficult to determine how far the camphor contributed to any benefit which may have been derived from the formula. Little reliance is placed upon it at the present day: still, as an adjunct to other remedies, it should not be lost sight of, as it is not likely it would for so long a period have maintained its reputation in this class of cases were it not possessed of some degree of efficiency. These remarks hold equally good in reference to *Inflammation, Inflammatory Affections*, and the *Exanthemata*.

552. *In Insanity*, the value of camphor has been variously estimated by different writers. In cases where much vascular excitement exists, it proves, according to Van der Kolk (pp. 142, 155) prejudicial; but where, in the absence of this, great excitement of the nervous system has to be subdued, it exercises a sedative influence and renders important service. The double action of camphor—(1) stimulating vascular action, and (2) subduing nervous excitement—should be kept in view in prescribing it in these cases. The doses require to be large, because small doses seem to have an exciting rather than a calming effect. Van der Kolk mentions a severe case of mania in which opium, leeches, purgatives, &c., failed, but in which gr. xx. of camphor combined with nitre, in the twenty-four hours, effected a cure. He, however, pronounces camphor very variable in its action on individuals, and adds it is impossible to determine beforehand whether it will agree or not. He failed to observe its sedative action on the sexual organs described by others. In a few cases of *Puerperal Mania*, he obtained good results from large doses of camphor with nitre.

553. *In Delirium Tremens* occurring in persons of a nervous habit, where the exhaustion is great and morphia inadmissible, Dr. Laycock states that camphor (gr. ij.–iij. every third hour) sometimes proves useful, or it may be given combined with carbonate of ammonia and henbane.

554. *In Asthma, Angina Pectoris*, and *Hooping-cough*, Dr. Copland speaks highly of camphor in combination with sedatives and antispasmodics, but it has fallen into comparative disuse; and in *Asthenic Pneumonia*, in which he regarded it as "one of the most valuable remedies that can be employed," it has been superseded by other more efficient drugs.

555. *Phthisis.* In the antiseptic or germicide treatment of consumption, Dr. Saundby[1] relies on two agents—camphor for the milder, and turpentine for the severer cases. The vapour of the camphor is to be inhaled by means of a Maw's inhaler, or jug of boiling water containing the drug, whilst camphor liniment is rubbed into the chest, or kept applied as directed in TURPENTINE (*q.v.*). Dr. Yeo,[2] however, objects to camphor in this mode of treatment—(1) on account of its rapid diffusibility; and (2) its unpleasant pungent odour.

556. *In Chorea*, Dr. Radcliffe (ii. p. 138) states that he places considerable confidence in camphor; he prescribes it generally dissolved in cod-liver oil (*q.v.*), and he considers that this combination is decidedly beneficial. *In Epilepsy*, it has been advised by Locker and others. It appears to be chiefly indicated when the disease is associated with *Hysteria*, or with uterine derangement, and should be given in combination with tonics and antispasmodics.

557. *In Rheumatic and Nervous Headaches*, the local application of Raspail's "Sedative Water" (*ut supra*) has in many instances been found to afford speedy relief. Another application useful in these cases is camphor (℥j.) dissolved in vinegar (Oj.) and freely diluted with 1 or 2 parts of water.

558. *In Diseases of the Heart*, camphor, according to Lombard, of Geneva, in doses of from gr. iij. to xij. daily, renders regular the most tumultuous *Palpitations*, and removes the *Dyspnœa attendant on Hypertrophy of the Heart with dilatation.* Quinine and iron may be given as tonics at the same time.

559. *Diseases of the Genito-urinary Organs. In Dysmenorrhœa*, Dr. Dewees (p. 137) regards camphor as the most certain and uniform palliative. He advises it in doses of gr. x. every one or two hours, until relief be obtained; or gr. xxx.–lx. in mucilage, with T. Opii f℥j., may be given as an injection. Camphor liniment applied to the loins often affords much relief in these and other *Uterine Pains*, and also in the *Lumbar Pains which some women suffer from in the latter months of pregnancy.* As an anodyne in *Cancer of the Uterus*, Dr. West (p. 403) usually commences with the following: ℞ Camphoræ, Ext. Hyoscyam. vel Conii āā gr. v. Ft. pil. h. s. s. When this begins to lose its power, instead of increasing its strength, he combines it with a draught containing ♏xx. of Spt. Etheris Co., or ♏xv. of chloric ether. Thus conjoined, he says, it will lull the pain and procure rest. And the same fact, he adds, holds good throughout the whole course of the disease, even when large and repeated doses of opiates have become absolutely necessary. Dr. Graily Hewitt (p. 379) states that he has often found a combination of camphor and Indian hemp of great service in relieving *Uterine and Ovarian Pain;* it is most useful when the pain is of a spasmodic character.

560. *In Pruritus Pudendi*, camphor reduced to powder and mixed with equal parts of powdered starch, well dusted on the

[1] Practitioner, Oct. 1881. [2] Brit. Med. Journ. July 1, 1882.

parts, is often serviceable. Dr. A. Jamieson[1] states that when combined with chloral hydrate forming a liquid, its efficiency is much increased: it may be painted on pure, or diluted with 2 or 3 parts of vaseline. Thus employed, he says, it forms one of the best means we possess for the relief of *Pruritus Ani*, when this does not depend on ascarides, or any evident cause. It causes much pain if applied to a denuded surface. Dr. Carson[2] speaks of camphor ointment applied to the surface of the rectum as a never-failing remedy in *Pruritus Ani*. He directs ʒj. of camphor to be finely powdered (but without too much spirit) and incorporated with ℥j. of lard. A portion of this is introduced into the rectum with the finger, is rubbed round on the rectal surface as far as the finger can reach. He says that he has never known it fail. *In Spermatorrhœa*, camphor is sometimes signally useful, but as a general rule it is inferior in efficacy to bromide of potassium. *In Chordee*, camphor, employed internally and locally, is often very useful. It may be given in doses of gr. iij.–v., with gr. j. of opium, in the form of pill, at bedtime. Camphorated mercurial ointment, or camphor (gr. xx.–xxx.) in a poultice, to the perinæum, is also very efficacious.

561. *Other Diseases.* *In Hysteria*, camphor proves most serviceable; it may be given alone, or combined with assafœtida or opium. Dr. Dewees considers that it is chiefly indicated and most efficacious in the hysterical paroxysms which precede the appearance of the menses. It may be given in doses of gr. v.–x., in julep or in powder, as may be most convenient

562. *Coryza*, "a cold in the head," may often be "cut short" by taking 10 or 15 or 20 drops of spirits of camphor (B. Ph.) repeated three or four times at intervals of an hour, commencing at the very outset of the attack: it may be given dropped on a lump of sugar or in milk, or in the form of "pilules," as sold by chemists. Even when it fails doing this, it seems to mitigate the severity of the subsequent attack. Inhaling the vapour of camphor often sensibly relieves the lacrimation, sneezing, and fulness of the frontal sinuses so troublesome in *Catarrhal attacks*. *In Hay Fever*, bathing the nostrils with hot water and spirits of camphor is often very serviceable in relieving the least irritation.

563. *In Mammary Congestion threatening Abscess*, the local application of camphor seems worthy of a trial. According to Dr. Harriss,[3] a saturated solution of camphor in glycerine, applied over the breast, is more effectual than belladonna in arresting the secretion of milk.

564. *In Toothache*, relief is sometimes afforded by introducing into a carious tooth a pill of camphor and opium, or a solution of camphor in spirit of turpentine.

565. *In Chronic Rheumatism*, friction with camphor liniment proves highly serviceable. Dr. Pereira (ii. p. 458) states that camphor (gr. v.–viij.) and opium (gr. j.), given internally, prove

[1] Practitioner, Sept. 1881.
[2] Brit. Med. Journ. March 3, 1883.
[3] Braithwaite, Retro. vol. xiv. p. 296.

useful by their sudorific and anodyne properties. Camphor fumigations are also occasionally attended with excellent effects. *In Syphilitic Rheumatism*, inunction of camphor with mercurial ointment is beneficial.

566. *In Summer Diarrhœa, and even in Cholera*, few if any remedies, Dr. Ringer observes (p. 404), are perhaps so efficacious as camphor, but it must be employed at the very commencement of the disease, or it will be without effect. His testimony in its favour in *Cholera*, drawn from personal experience, is very strong: "By it, the vomiting and diarrhœa are generally at once controlled, and often altogether checked, while the cramps are removed and warmth is restored to the extremities." To obtain these effects, gutt. vj. of a strong alcoholic solution of camphor should be given, at first every ten minutes, and when the symptoms have abated, less frequently. Dr. Rubini, of Naples, is reported not to have lost a single patient out of 592 cases of cholera treated with a solution of camphor in alcohol at 60° overproof (equal parts). Of this the commencing dose is four drops every five minutes; in severe cases, twenty drops, or more, to be persevered in till reaction sets in. The patient is to lie down well wrapped up in blankets. As a preventive, he gives five drops of the saturated solution daily. It should be given on sugar, not in water, as in the latter the camphor solidifies, and loses its power.[1]

567. *In Gangrene*, when the vital powers are greatly depressed, and when at the same time much nervous irritability is present, full doses of camphor, combined with opium and other stimulants, prove highly serviceable. Two cases of *Hospital Gangrene* successfully treated with the local application of powdered camphor are recorded by M. Netter.[2]

568. *In Phagedœnic Chancres*, M. Baudoin[3] successfully employed powdered camphor in three instances. In these cases it may be advantageously conjoined with charcoal.

569. *To prevent Bedsores*, Dr. Graves[4] advises washing the parts with camphorated spirits of wine when any discoloration occurs. For arresting *Boils* in their early stage, the application of camphorated alcohol is said to be very effectual.[5] *In Eczema* and other *Skin Diseases attended with burning heat*, camphor may be advantageously employed as a local sedative. For this purpose Dr. Hillier (p. 362) recommends the following powder to be dusted over the part: ℞ Camphoræ ʒj., Sp. Vin. Rect. q.s., Zinci Oxid., Pulv. Amyli āā ʒvj. M. Dr. T. McCall Anderson[6] advises that the eczematous surface be sprinkled over with a small quantity of a powder containing camphor, and that a cold potato-starch poultice be afterwards applied.

570. Camphora Monobromata. Monobromide of Camphor.

Med. Prop. and Action. Is derived from bromide of camphor; it occurs in long transparent prisms smelling strongly of camphor. It is soluble in ether,

[1] Braithwaite, Retro. vol. liv. p. 399.
[2] Practitioner, Sept. 1872, p. 180.
[3] Lancet, Oct. 14, 1871.
[4] Clin. Lect. vol. i. p. 187.
[5] Brit. Med. Journ. Dec. 21, 1872.
[6] Med. Times, July 11, 1863.

alcohol, and fixed oils. Its physiological action has been worked out by Dr. Bourneville.[1] It lessens the number of the heart's beats, and decreases the calibre of the vessels. It also diminishes the number of respirations. It lowers temperature in a regular and constant manner. Dr. Bourneville adds: "The monobromide of camphor possesses undeniable hypnotic properties. It seems to act principally upon the cerebral nervous system." It appears also from his experiments that tolerance of the drug is not obtained by frequent dosage. The monobromide may be given in pill with Conf. Ros. as excipient, or may be suspended in mucilage with syrup. It is recommended in doses of from gr. ii. to v.; the taste is, however, very nauseous. Experiments instituted by Dr. Lawson[2] do not agree in their results on all points with Dr. Bourneville's. The former finds the monobromide gives rise to great gastric irritation, and that through its insolubility it is difficult of application.

571. *Therapeutic Uses. In Rambling Delirium,* Dr. Bourneville, from his own experience and from that of others which he quotes, finds the monobromide useful as a nervine sedative. *In Convulsions of Children,* Professor Hammond, of New York, says gr. j. checks teething convulsions. He also uses this remedy in *Hysteria.*

572. *Insomnia.* The experience of the Paris hospitals is in favour of the monobromide as an hypnotic.

573. *Chorea, Hystero-Epilepsy,* and *Epilepsy,* according to Dr. Bourneville, are relieved, if not permanently benefited. Dr. Lawson regards its bulk and insolubility as a great impediment to its exhibition in medicine.

574. CANNABIS SATIVA, *Linn.* CANNABIS INDICA. Indian Hemp. It is grown in India. The dried flowering tops of the female plant, from which the resin has not been removed. (*Gunjah.*) *Churrus* is the Hindústani name of the resinous exudation from the leaves, stems, and flowers; and *Bang, Subjee,* or *Sidhee,* that of the larger leaves and capsules without the stalks. *Hashish* (*Arab.*) consists of the dried tops and tender parts of the plant collected immediately after inflorescence.

Med. Prop. and Action. The intoxicating properties of Indian hemp appear to have been known for a long period in the East; but its medicinal qualities were first investigated by Sir W. O'Shaughnessy in 1838. The first effect of a large dose, he observes, is decidedly stimulant, producing increased arterial action and a great exhilaration of spirits; the patient is very talkative, singing songs, asking for food, and declaring himself in perfect health. This state gradually passing off, is followed by a complete state of catalepsy, which lasts for some hours, and then subsides, leaving the patient without headache, pain, or any other ill consequence. In all the cases in which it was tried, the effects were closely analogous; alleviation of pain in most, remarkable increase of appetite, unequivocal aphrodisia, and great mental cheerfulness. The pupils were freely contractible on the approach of light. In those who habituate themselves greatly to its use, or in those who try it for the first time, there occasionally occurs a species of insanity closely resembling delirium tremens. This state is at once recognised by the strange balancing gait of the patient, a constant rubbing of the hands, perpetual giggling, and a propensity to caress the bystanders. The eye wears an expression of cunning and merriment; there is no increase of heat or frequency of the circulation; the skin and functions remain natural. In a few instances the patients are violent, in many highly aphrodisiac, and all voraciously hungry. A blister to the nape of the

[1] Practitioner, vol. xii. p. 112. [2] Practitioner, vols. xiii. and xiv.

neck, antimonials, and salines are sufficient to remove this state. Dr. Anstie (p. 189) draws an interesting comparison between the inebriation caused by hashish and that by alcohol and chloroform. Upon the brain of civilized men, he remarks, this narcotic rarely works so as to produce that fierce uncontrollable outburst of passion which is so often witnessed in the drunkenness due to either of the other two agents. Its effects upon the mind are almost equally decisive as regards the obliteration or disturbance of the consciousness of surrounding circumstances as those of alcohol or chloroform; but instead of violent bursts of passion, a placid, self-complacent vanity is developed, which makes the subject of it feel himself the greatest being, physically and mentally, in the universe. Yet even hashish, taken by the half-savage of some wild oriental tribe, has as powerful an influence in letting loose fierce passions as the rawest whisky has upon the most brutish navvy. Much interesting information on the physiological action of Indian hemp will be found in Dr. H. C. Wood's account of his trials with it in his own person ("Therap." p. 241), and in "The Madras Report on the Use and Abuse of the Bazaar Preparations of Indian Hemp," in Madras Monthly Journal of Med. Sci. vol. vii. (1873), pp. 85, 168. After extensive trials with Indian hemp, Dr. Clendinning[1] characterizes it as "a soporific or hypnotic, in conciliating sleep; as an anodyne, in lulling irritation; as an antispasmodic, in checking cough and cramp; and as a nervine stimulant, in removing languor and anxiety." Much variety of opinion has been expressed as to the hypnotic powers of Indian hemp: the fact seems to be that it is not, in the true sense of the word, a narcotic, but that by its powerful anodyne operations it relieves pain and spasm so effectually that sleep becomes possible; it is thus *indirectly* soporific. The great objection to its use is the uncertainty of its operation; some constitutions being little effected by it. A dose which will produce powerful effects in one individual, will perhaps exercise little or no influence on another. Dr. Bryan found the tincture (mxx. every four hours) act effectually as a diuretic, especially when diuresis had been first established by other remedies: it seemed then to maintain the action already begun. According to Christison, it possesses the power of inducing uterine contractions in labour. Larger doses are stated by O'Shaughnessy to be required in cold than in hot climates to produce the equivalent effects. Its effects appear to reside in an acrid resin, *Cannabin*.

Dose:—Of the Extract, gr. ¼-gr. j. *Of the Tincture*, mv.-xx.

575. *Therapeutic Uses. Nervous and Spasmodic Diseases. In Tetanus*, the results attendant on the internal use of Indian Hemp are varied and inconclusive, failing in the hands of Dr. Laurie,[2] and succeeding in those of Dr. O'Shaughnessy,[3] Miller,[4] and Chuckerbutty.[5] Dr. Chuckerbutty concludes, from a somewhat large experience, that the tincture in large doses (mxx.-xl.-lx. every two or three hours) is quite sufficient to meet every indication. Dr. Roemer (cited by Wood, p. 245) has collected histories of thirty-five cases thus treated, showing twenty-one recoveries and fourteen deaths. A more promising form of administration is that introduced by Assist.-Surgeon A. C. Khastagir[6]—viz., smoking Gunjah (the dried flowering tops of C. sativa). This will probably supersede all other treatment in India, if it were only from the fact that the remedy is procurable at a trifling cost in every bazaar throughout the land, and that its application is simple in the extreme. A

[1] Med. Chir. Trans. vol. xxvi.
[2] Lond. and Edin. Monthly Journ. Nov. 1844.
[3] Bengal Disp. p. 508.
[4] Brit. and For. Med. Chir. Rev. Jan. 1851.
[5] Indian Ann. of Med. Sci. 1868, xii. 187.
[6] Indian Med. Gaz. Aug. 1878.

pipe, hookah, or Indian hubble-bubble charged with 15 grains of gunjah alone, or mixed with twice as much tobacco-leaf, is kept in readiness, and immediately on the indication of a spasm coming on, it is lighted and handed to the patient, with direction to smoke. By the time this is finished, or even before, the spasm relaxes, the eyes close, and the patient falls into a kind of slumber. The pipe is again charged and kept in readiness for the approach of the next spasm, when the process is repeated with similar results. In this way the drug is administered day and night uninterruptedly, during which the irritation of the nervous system slowly but steadily yields to its influence. Mr. Khastigar details five cases successfully treated in this manner. No auxiliary medicine beyond a purgative was given: no solid food allowed: milk and soup the only nutriment. This treatment is further advocated by Dr. J. C. Lucas:[1] the advantages he claims for it are—(1) the spasms are cut short, (2) they reappear at longer and longer intervals, (3) they are less severe; this (4) saves the patient's vital powers, and thus by prolonging life and preventing death, life, which would otherwise have succumbed, may eventually be saved. He places the dose at from 8 to 30 grains, commencing with the smaller dose and gradually increasing it as tolerance is established. He insists on the vast importance of quiet—perfect quiet—in a pure air (without too much breeze or draught), and he directs that the patient should on no account be disturbed to take his food or for any other purpose, for which opportunity should be taken when the patient wakes of his own accord, or from the recurrence of spasm. In the case of very young children this treatment is of course inapplicable, but in others it seems well worthy of a fair trial.

576. *In Chorea*, small and often-repeated doses are sometimes useful. *In the Sleeplessness attendant on severe Chorea*, Dr. Oxley[2] states that he has found the tincture more effectual than any other hypnotic. He prescribes ℳx. for a child æt. seven, and so on. *In Epilepsy*, it has also been advised, but Dr. Russell Reynolds (ii. p. 280) states, that though it has been found to relieve headache and restlessness, it has not cured nor notably relieved epilepsy.

577. *In Delirium Tremens*, O'Shaughnessy, after an extensive trial with cannabis, reported highly of its powers, but it does not appear to have come into general use. When there is any reason, from the quality of the pulse, to believe that the circulation is much enfeebled, Dr. Anstie (ii. p. 91) regards Indian hemp as preferable to opium, and from it, he states, he has seen excellent results. He prescribes gr. $\frac{1}{4}$-$\frac{1}{2}$ of a good extract. *In Nocturnal Delirium occurring in Softening of the Brain*, judicious administration of liquid nourishment, with small quantities of wine, may suffice to give relief. Should this fail, the most useful medicine is Ext. Cannabis, in doses of gr. $\frac{1}{4}$-$\frac{1}{2}$. (Drs. Russell Reynolds and Bastian.[3])

578. *In Sciatica, Tic Douloureux, and other forms of Neuralgia,*

[1] Med. Times, Feb. 21, 1880.
[2] Liverpool Med. Surg. Reports, 1868.
[3] Reynolds's Syst. of Med. ii. p. 477.

Indian hemp ranks next in value to morphia and atropia (*q.v.*). It has been especially brought forward by Dr. Reynolds. Of a *good* extract, gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$, rarely gr. j., in the form of pill, is very effective in some forms of neuralgia, particularly in *Migraine*. Even in the severest and most intractable forms it often palliates greatly. It should be given every night, whether there be pain or not. (Dr. Anstie, ii. p. 749.) Its value in *Migraine* is testified to by Mr. Donovan,[1] Dr. R. Greene,[2] &c.; and Dr. Ringer states (p. 581) that in this affection, no single drug has he found so useful. It may be given in doses of gr. $\frac{1}{3}$ to gr. $\frac{1}{2}$ of the extract twice or thrice daily, conjoined with iron if anæmia is present, or with aloes if constipation exists. Care should be taken that the extract is of good quality.

579. *In Chronic Rheumatism*, Dr. Fuller has in some cases found its use beneficial. Its use must be attended with caution, as it is liable in some cases to provoke excitement.

580. *In Asthma*, it has obtained some reputation, which clinical experience has not confirmed. *In Hay Fever and Hay Asthma*, Dr. Mackenzie states that he has seen such favourable effects from Indian hemp, in cases of morbid irritability of the nervous system, that he is induced to recommend a trial of it in the present disease. *In Senile Catarrh*, it is highly spoken of by Dr. Waring-Curran, as a sedative and expectorant. He prescribes the following mixture: —℞ T. Cannabis f℥ij., P. Trag. Co. ℥j., Æther. Chloric. ℥jss., Aq. Anisi ad ℥vj. M. Dose, f℥j. every second hour.

581. *In Menorrhagia and Uterine Hæmorrhage*, the tincture of hemp, in doses of gutt. v.–x., thrice daily, has been successfully employed by Dr. Churchill, of Dublin, on the recommendation of Dr. Macguire. Dr. Churchill, after an extensive trial of its virtues, states that it was productive of extraordinary success, both in the number relieved and the rapidity of cure. *In impending Abortion*, he also found it very effectual in several cases. Dr. M'Clintock found it capable of controlling *Hæmorrhage arising from the presence of Fibrous Tumours of the Uterus*. *In Cancer of the Uterus*, Dr. Graily Hewitt (p. 379) remarks that Indian hemp in many cases undoubtedly exercises a marked influence in allaying or preventing pain. Like others, however, he finds it affect different individuals very unequally. Dr. West (p. 403) prefers it to opium, as liable to cause headache and digestive derangement. *In Dysmenorrhœa*, Dr. Hewitt regards it as a valuable medicine in certain cases (p. 443); and Dr. West (p. 82) speaks of it as a very useful remedy, free from many of the inconveniences of opium. He advises commencing with ℥xv. of the tincture, and increasing it according to circumstances.

582. *In lingering and protracted Labours depending upon Atony of the Uterus, and Insufficiency of Uterine Contractions*, Christison found the tincture of Indian hemp highly serviceable. He gave it in doses of gutt. xxx., and remarks that in none of the instances in which he administered it were the ordinary physiological effects

[1] Dublin Med. Journ. xxvi. p. 401. [2] Practitioner, Nov. 1872.

produced; there was no excitement or intoxicating action, and there did not seem to be the least tendency to sleep. Compared with ergot of rye, he observes:—1. While the effect of the ergot does not come on for some considerable time, that of hemp, if it is to appear, is observed within two or three minutes; 2. The action of ergot is of a lasting character; that of hemp is confined to a few pains, shortly after its administration; 3. The action of hemp is more energetic, and perhaps more certainly induced, than that of ergot.

583. *In violent Palpitation of the Heart*, Christison found the Indian hemp succeed when all other remedies had failed to afford relief. He quotes a case of twenty-one years' standing in which it had a very beneficial effect.

584. *In Eczema, with intense itching*, when morphia in large doses not only failed to procure sleep, but appeared to aggravate the severity of the pruritus, the tincture, in doses of gutt. xxv., induced sleep and comparative ease. It was continued every night for six weeks, without increasing the original dose, until the eruption was nearly removed, but the itching continued as before when the patient was awake. (Christison.) It might prove useful in *Pruritus Pudendi.*

585. *In Ulcer of the Stomach*, Dr. Brinton (p. 190) remarks that the extract of hemp sometimes answers admirably as a sedative; indeed, he adds, were its effects more uniform, it might often be advantageously substituted for opium itself.

586. *In Hysteria*, Indian hemp has proved of service when other remedies have failed, but in the majority of cases it is of little use. (Dr. Russell Reynolds.)

587. *In Dropsical Affections*, the tincture (♏xx. every four hours) proved effectual as a diuretic in the hands of Dr. Bryan; and in *Bright's Disease* it seems occasionally of service, especially when blood is present in the urine, but except as a palliative it is of little use.

588. Cantharis. Cantharis vesicatoria. Cantharides. The Blister Beetle, or Spanish Fly.

Med. Prop. and Action. All the species of Cantharis, Mylabris, and Lytta, when applied to the skin, are powerful irritants and vesicants; their irritant property depending upon the presence of an acrid crystallizable principle, *Cantharidine*, which is common to the whole family. Cantharidine is soluble in ether, strong acetic acid, and chloroform, and is the active ingredient in the various blistering fluids and blistering tissues which are used as substitutes for the ordinary blister plaster. Internally, cantharides is only employed in the form of tincture, in doses of ♏v. cautiously increased to ♏xxx. daily, with the copious use of diluents and demulcents. Thus given, it is a stimulant diuretic, and appears to exercise a peculiar action over the mucous membrane of the genito-urinary system, and particularly on the neck of the bladder. Some pathologists, including M. Morel-Lavallée, consider that cantharides acts specifically on the bladder, occasioning inflammation and vesication of that viscus; but M. Bouillaud has shown that the topical action is upon the kidneys, of which the internal membrane experiences its vesicating action, in consequence of which the urine becomes charged with albumen. It is really an endonephritis and not a cystitis that constitutes the *point*

du depart of the albuminuria produced by cantharides. If the renal irritation becomes more severe, a nephritis parenchymatosa is established. M. Gubler,[1] who quotes these authorities, adds some interesting observations on the important part which the albumen of the blood plays in preventing the toxic effects of this and other similar substances. It has long been regarded as an aphrodisiac, but its powers in this character are very problematical, though beyond a doubt it acts as a stimulant or irritant of the genito-urinary system. Cantharidine being rapidly soluble in oil, it is injudicious and unsafe to administer oleaginous substances at the same time as cantharides, as the active principle may thus become freed, being absorbed into the system, may produce poisonous effects. In large or poisonous doses, it causes a burning pain in the throat and pit of the stomach, extending at length over the whole abdomen; excessive pain in swallowing; dryness of the fauces; copious discharge of blood or bloody mucus from the stomach, and in less quantity from the bowels; tenesmus; distressing strangury: bloody urine; priapism; and inflammation of the genital organs. Salivation and lacrimation are occasionally present. The patient is restless, the breathing laborious, the pulse quick and hard; headache, delirium, and convulsions are sometimes superadded.

Post-mortem appearances. Inflammation of the whole alimentary canal, and of the urinary and genital organs; the brain gorged with blood. The powder of cantharides has been found in the stomach nine months after death.

Treatment of an over-dose. Copious diluents, vomiting by emetics, or warm liquids, emollient and opiate enemas. Camphor (gr. ij.-vj.) or opiates by mouth, and strict antiphlogistic diet.

Dose:—Of the Tincture, ɱv.-xx., twice or thrice daily. For external use only:—*Acetum Cantharidis, Liq. Epispasticus.* (Lin. Cantharidis, B. Ph., 1864.) *Emp. Cantharidis, Ung. Cantharidis, Charta Epispasticus, and Emp. Calefaciens.*

589. *Therapeutic Uses. Diseases of the Genito-urinary system. In Amenorrhœa*, Dr. Dewees places much confidence in the internal use of tincture of cantharides. He commences with a dose of gutt. xx., and gradually increases the quantity to gutt. xxxv. or xl. If it does not succeed in these doses, he does not consider that it will prove ultimately useful.

590. *In Leucorrhœa*, the value of cantharides has been extolled, especially by Drs. Robertson,[2] Dewees (p. 75), and Dr. D. Davis.[3] It was given in doses of gutt. xx. of the tincture thrice daily in a demulcent draught, and the dose subsequently increased to gutt. xl.–l., until it produced slight strangury, when it was discontinued, or the dose diminished. The average period of cure under this treatment was about four months. Though so highly spoken of, it has fallen into comparative disuse.

591. *In Paralysis of the Bladder*, and in *Incontinence of Urine* dependent on an atonic state of the bladder, the tincture of cantharides may often be given with excellent effect. It appears to act locally upon the urinary organs, stimulating the parts, and restoring to the bladder its healthy tone. Its use should be confined to adults. *In Impotence*, it is occasionally employed as a stimulant of the generative organs. It is of doubtful efficacy. Dr. Ringer (p. 417) states that a drop of the tincture, thrice daily, will in the majority of cases remove *Chordee*. Pereira found benefit from a mixture of

[1] Practitioner, April 1872.
[2] Treatise on Cantharides, 1806.
[3] Obstet. Med. 2nd edit. p. 281.

equal parts of T. Ferri Perchlor. and T. Cantharidis in *Gonorrhœa of long standing*, and even in the acute and earlier stages cantharides has been employed, but the practice is of doubtful utility, or even of safety.

592. *In Suppression of Urine*, cantharides proved successful in the hands of Sir A. Cooper, and in the practice of others it has occasionally been useful; but the treatment is not devoid of danger, and it will often prove ineffectual.

593. *Other diseases. In Bright's Disease*, cantharides internally has been employed with alleged benefit, and in purely chronic cases it may prove serviceable; but even here, unless used with the greatest caution, it may prove highly prejudicial. Dr. Ringer (p. 415) speaks favourably of its use in Bright's disease after the subsidence of fever and inflammation, in doses of ♏j.–iij. of the tincture every three hours. *In Dropsy accompanying Bright's Disease*, Dr. Wells in seven cases employed the tincture (gutt. xxx.–lx. daily) with good effect in five. Rayer also reports well of it in some cases, but thinks it an uncertain remedy, which might be dangerous in inexperienced hands. (Dr. Roberts.) It would be as well to adhere to Dr. Ringer's mode of administration.

594. *In Paraplegia*, Sir T. Watson (i. p. 547) recommends tincture of cantharides.

595. *In Chronic Hooping-cough*, the following formula was held by Dr. Graves to be efficacious in many instances:—℞ Infus. Cinchon. Co. f℥vj., T. Canthar., T. Opii, āā f℥ss. M. Dose, ℥j.–℥iv. three times a day.

596. *In Deafness* depending upon a thickened state of the membrana tympani, Toynbee[1] recommends the application of an ointment composed of gr. xxx. of powdered cantharides and ℥j. of lard. It should be applied below and behind the ear twice daily.

597. *In Alopecia and Loss of Hair after Fevers, &c.*, a mixture of 1 part of T. Cantharidis and 8 of castor-oil, well rubbed into the roots of the hair night and morning, is often very serviceable. *In Tinea Decalvans*, Dr. Hillier (p. 358) has found it most useful to apply, at long intervals, Acetum Cantharidis to the bald patches, and to paint them every other day with T. Iodi; to wash the head twice a week with soap and cold water; and to apply a wash containing T. Cantharidis ℥j., Spt. Ammon. Arom. ℥ss., Aq. ℥x., and Rum Oj., to the parts of the head which are not bald, twice a week. Arsenic appears to aid the cure sometimes; in others, iron proves useful.

598. *In Obstinate Ulcerations*, Mr. Tait speaks highly of the value of cantharides employed both internally and externally. For internal use he advises the following: ℞ T. Canthar. ♏xij., Potas. Iod. ℥ss., T. Cinchon. Co. f℥j., Aq. f℥vij. M. Sumat f℥j., ter in die. For local application:—℞ T. Canthar. ♏xij., Acid. Nit. Dil. ♏xx., T. Cinchon. Co. f℥ij., Aquæ f℥j. M. Under the use of these formulæ he found the most obstinate ulcerations met with in

[1] Monthly Journ. March 1849.

Burmah, to yield completely. *To unbroken Chilblains* the following is an excellent application :—℞. T. Canthar. f℥j., Lin. Sapon. f℥vj. M. To be applied night and morning.

599. *Theory of Action of Counter-Irritants.* By increasing the amount of blood in one area, another area becomes freed from excess—*e.g.*, in inflammation of a joint it is assumed that a blister, by creating cutaneous hyperæmia, relieves the deeply seated vessels. By peripheral stimulation of vaso-motor and trophic nerves, variations in the nutritive and vascular conditions of the parts are caused, which variations are beneficial to the tissues, the seat of inflammation.

600. *Observations on the use of Blisters.* 1. Never apply a blister at the beginning of inflammation ; never in its acute stage ; wait till this has been subdued by appropriate remedies, and then it may be employed with advantage. 2. Do not apply a blister where the skin is thin and tender, for example, to the scrotum or mamma, as it causes intolerable irritation ; nor over a bony prominence, as the process of healing will be slow and difficult. 3. In many instances, as in acute laryngitis, it is inadvisable to apply a blister immediately over the seat of the disease, as it sometimes aggravates the symptoms, and prevents the application of leeches and other local measures which may be necessary. 4. A blister is often more efficacious if applied to a part far removed from the seat of disease,—*e.g.*, to the heel in sciatica and lumbago. 5. Do not allow a blister to remain on for twelve or twenty-four hours, as is sometimes done, but remove it at the end of six or eight hours, and apply a soft warm poultice. Vesication soon ensues. 6. Do not apply a blister to the chest or mamma during pregnancy.

601. *To obviate the Strangury which arises from the use of Cantharides blister*, one of the following plans may be resorted to :— 1. Remove the blister as soon as it causes decided pain, although the part be not vesicated, and apply simple dressings ; free vesication subsequently occurs. 2. Insert an extremely thin piece of paper or muslin between the blister and the skin. 3. Let the patient drink plentifully of diluents and demulcents, avoiding those of an oleaginous description.

602. *Cautions and Contra-indications.* 1. Pregnancy. 2. Scurvy and weakly condition of the vascular system ; here they are apt to produce gangrene. 3. The first stage of acute Inflammation. 4. In young children blisters should be avoided. 5. *Open or Perpetual Blisters.* When it is desirable to keep the part under counter-irritation, Brodie's method of the frequent use of flying blisters is certainly preferable to keeping the blistered surface raw with savin ointment; indeed, this last method has been followed by very serious consequences, and has been almost entirely relinquished.

603. *Therapeutic Uses. In ordinary cases of Inflammatory, Continued, or Remittent Fever*, blisters are rarely called for; but when the disease is complicated with inflammation of the lungs, heart, brain, or other important viscera, blisters prove of the highest

service. In the advanced stages also, when the vital powers are greatly depressed, the action of the heart feeble, and when there is much debility, flying blisters—*i.e.*, those allowed to remain on for two or three hours and then removed—tend to restore the vital powers. *In Bilious, Remittent, or Yellow Fever*, a blister to the whole length of the spine, in a certain number of cases, has been said to allay the irritability of the stomach in many cases; it has been also found useful when cerebral complications exist. *In Typhus and Typhoid Fevers*, sinapisms and turpentine epithems are preferable. In the *Coma of these Fevers*, a blister to the scalp may, it is said, have the effect of arousing the patient.

604. *Diseases of the Brain, Spine, &c. In Sanguinous Apoplexy*, very little benefit will accrue from blisters; but in *Simple*, or so-called "*Serous*" *Apoplexy*, some advantage was formerly believed to accrue from the application of blisters to the calves of the legs, and sometimes to the nape of the neck. In all these cases, however, the modern use is to restrict the employment of blisters, and to only have resort to them in carefully selected cases, and when their effect can be watched.

605. *In Insanity*, blisters are much less employed now than they were formerly. Dr. Maudsley deprecates their use. Still there are chronic cases, characterized by stupor or severe cephalalgia, which are benefited by blisters to the extremities. *In Acute Delirious Mania*, blisters are of very doubtful utility.

606. *In Meningitis* (non-tubercular), blisters may prove occasionally of great use. They are inadmissible during the acute stage.

607. *Paralysis and other Nervous and Spinal Affections*, where there is reason to suspect effusion within the theca, blisters to the spine may be used with advantage. *In Epilepsy, to arrest the aura*, Dr. Buzzard[1] in some instances found a narrow circular blister applied above or at the starting-point of the aura effectual in preventing or modifying a paroxysm; in others, however, it failed. He was induced in the first instance to resort to this mode of treatment by the observations of Dr. Brown-Séquard, who has shown that convulsions, even of a tetanic character, are often arrested by severely irritating the sensory nerves, as by violent flexion of the great toe. He explains the action of the ligature, which it is well known will sometimes succeed in arresting an epileptic fit, by showing that it does not act by preventing the passage of an aura to the brain, but by setting up a fresh irritation, which counteracts the pre-existing one.[2] A very narrow ring of vesication, made by means of blistering fluid, is all that is necessary, or indeed advisable. *In Hysterical Paralysis*, Dr. Russell Reynolds (ii. p. 329) states that he knows of no mode of treatment comparable in efficiency with that of placing narrow strips of blister completely round the affected limbs. This measure, he adds, has succeeded perfectly and rapidly after all other plans have failed; it is well worthy of a trial in all cases. He mentions a case of *Hysterical*

[1] Practitioner, Oct. 1868.

[2] Practitioner, Dec. 1868.

Aphonia which had resisted electrical treatment, but yielded to a strip of blister round the throat.

608. *Diseases of the Chest. Of Pericarditis, Pleuritis, Bronchitis, Pneumonia and Laryngitis*, it may be stated generally that blisters in the early or acute stage are productive of more harm than good, but in the advanced stages they may be resorted to with manifest advantage; and when effusion has taken place, especially in *Hydrothoraæ* and *Hydropericardium*, they certainly seem to stimulate the absorbents to action, and to aid in the removal of the effused fluid and other morbid deposits.

609. *Obstinate Pleurodynia* will often yield to a blister over the seat of pain, when other remedies have failed. (Ringer, p. 284.)

610. *Diseases of the Genito-urinary Organs. In Inflammation of the Kidneys and Bladder*, blisters are rarely required, and there is especial objection in these cases to cantharides, as the absorption of the active principle, cantharidin, would increase the irritation and aggravate the symptoms. They are sometimes of great service in *Subacute Ovaritis*, placed over the ovarian region.

611. *In Dysmenorrhœa and Leucorrhœa*, great benefit often accrues from a blister applied to the sacrum, and either kept open or repeated. The value of blisters to the cervix uteri in the minor idiopathic *Affections of the Uterus and Ovaries* is well established. The best and most speedy way of effecting this is by means of a strong solution of cantharides applied by a camel-hair pencil. An anodyne should be added to prevent pain: no unpleasant symptoms generally follow; cicatrization soon takes place. Care should be taken that the fluid does not extend beyond the parts. Dr. Tilt considers that the advantages of directly blistering the cervix have been exaggerated, though in some instances he has seen it subdue *subacute chronic irritation and swelling of the cervix uteri.*

612. *In Incontinence of Urine in Children*, when belladonna and other remedies fail, a blister to the sacrum, repeated according to circumstances, sometimes proves effectual.

613. *In Chronic Inflammation of the Prostate*, Sir H. Thompson (p. 155) has seen the best results from a small blister on either side of the raphé of the perinæum, made by liquor epispasticus, every four or five days. It should not be large enough to distress the patient or prevent locomotion, and should be kept open four or six weeks. Tonic medicines and regimen should be enjoined at the same time.

614. *In Gleet*, the application of blisters to the penis is strongly advised by Mr. Milton, who considers that every gonorrhœa or gleet, however obstinate, may, if uncomplicated, be cured by blistering, singly or combined with the use of an injection (Zinci Sulph. ʒj., Aq. Oj.). Before applying the blister, the hair at the root of the penis is to be cut off, a piece of paper is then to be fitted on the penis, and cut till it exactly covers it, from the root to within half an inch of the mouth of the urethra. This is then laid down on the blister, which is cut out by it, wrapped round

the penis and fastened with threads. Care is necessary to prevent the ointment spreading to the scrotum. In mild cases, it may remain on an hour and a half, and the vesicated spots dressed with zinc ointment; a T-bandage should be worn.

615. *Diseases of the Abdominal Viscera. In Acute Peritonitis and Enteritis*, blisters are inadmissible in the early stages, but in the advanced stages, especially if effusion has taken place, they may be resorted to with advantage.

616. *In obstinate Subacute Diarrhœa*, a small blister to the abdomen is sometimes effectual, when all other measures have failed. It may be used in conjunction with other remedies.

617. *In the Collapse of Cholera*, flying blisters (*ante*) may be applied to the epigastrium, the region of the heart, &c. Occasionally they prove highly serviceable in reviving the patient and restoring the vital energies, but they more frequently are of little avail. In some of the sequences of cholera, their efficacy is undoubted.

618. *Vomiting, arising from functional or nervous disorder of the Stomach, and that also consequent on Fevers*, is often effectually relieved by a small blister over the epigastric region.

619. *Regurgitation of Food.* When this is either purely nervous or neuralgic, benefit sometimes follows from small blisters applied simultaneously to the pit of the stomach and to the spine. In some instances, this treatment was attended with speedy and permanent benefit; in others, the relief was only temporary.

620. *Diseases of the Eye.* Blisters applied behind the ear or over the temple are useful in relieving the pain of *Iritis*, and have been recommended for *Variolous Ulceration of the Cornea, Amaurosis;* according to Bampfield,[1] *Hemeralopia* is relieved by their use.

621. *In Acute Rheumatism*, "the blister treatment," which consists of covering the inflamed joints with blisters, at one time attracted much notice. Dr. Herbert Davies, the chief advocate of this method, directs armlets, wristlets, and even fingerlets of blister plaster, to be applied at the time when the inflammation is most acute; linseed-meal poultices being subsequently applied to keep up the serous discharge; he places these blisters entirely round the affected limbs, and in the case of the knees orders them of at least three inches wide, regarding any slight strangury which may arise as of little importance compared with the benefit afforded by the free vesication. According to Dr. Davies, this treatment causes a speedy diminution in the frequency of the pulse, rapid subsidence of the joint affection, and diminished liability to cardiac inflammation; within twenty-four hours after the removal of the blisters the urine is stated to become alkaline in reaction.[2] Dr. Ringer (p. 284) considers that all the alleged good effects may be more surely obtained by the use of "flying blisters." Dr. A. Fleischmann[3] looks upon a blister (about two inches square), an inch and a half below the left clavicle, as an almost certain preventive of

[1] Med.-Chir. Trans. vol. v. p. 47.
[2] Reynold's Syst. of Med. i. p. 914.
[3] Lancet, May 1, 1869.

cardiac mischief. *In Rheumatic Carditis*, in the advanced stages, when effusion has taken place, blistering is, according to Dr. Fuller, of all local remedies the most serviceable. Its efficacy appears to vary in proportion to the amount of liquid effusion, its virtue being most unequivocally displayed when the amount of fluid is greatest.

622. *In Chronic Rheumatism*, the value of blisters has been variously estimated, according as they have been made use of properly or improperly. In muscular rheumatism they are seldom of much service, and are rarely if ever necessary in articular rheumatism; they are never needed unless the pain has been long fixed in one particular joint, or some thickening or enlargement has gradually taken place. But in periosteal rheumatism they are extremely serviceable, more especially when there is thickening; and in *Rheumatic Enlargement of the Bursæ*, which has passed into a chronic form, they are almost indispensable for effecting a rapid cure. In both these latter cases their application should be followed by the external use of iodine (*q.v.*).

623. *In Neuralgia*, a blister is often of great service; vesication is not essential, all the benefit to be expected from it may be obtained from flying blisters. In numerous early cases, observes Dr. Anstie (ii. p. 750), one or two flying blisters applied successively over different points in the course of the painful nerve, have at once and permanently arrested the disease. Dr. Anstie commends applying a blister close to the spine, as nearly as possible opposite the intervertebral foramen, from which the affected nerve issues. Blistering the nape of the neck relieves the pain of *Trigeminal Neuralgia*. *In Sciatica*, great and immediate benefit sometimes results from the plan proposed by Dr. Fiorvante, of applying a blister to the heel.

624. *In Hydrarthrosis*, blisters are often strikingly beneficial, and will in some instances effect a cure without the aid of other remedies. A succession of blisters conjoined with perfect rest of the part should be enjoined. They are particularly useful in effusion into the knee-joint.

625. *In Otitis*, blisters behind the ears, stretching to the occiput, or on the nape of the neck, and either kept discharging or repeated, are often very serviceable. The same measures are often highly beneficial in *Deafness depending upon circumscribed Inflammation of the Auditory Passage and Membrana Tympani*.

626. *In Ringworm*. In severe and intractable cases, painting the shaven scalp with liquor epispasticus will succeed in some instances. It is a painful method, however, and may lead to the destruction of the hair follicles, and hence baldness.

627. Capsicum. Capsici Fructus.

Med. Prop. and Action. An acrid stimulant. In small medicinal doses it causes a sensation of warmth in the stomach, promotes the digestive process, and stimulates the genito-urinary organs. In excessive doses it is an irritant poison. Externally applied, it is rubefacient. Its activity depends upon an

acrid oleo-resin, *Capsicin*, which Pereira states is so powerful an irritant that half a grain of it, volatilized in a large room, causes all who inspire it to cough and sneeze.

Dose :— Of Capsicum powdered, gr. j.–iv. *Of the Tincture*, ♏x.–xx

628. *Therapeutic Uses. In Scarlatina*, the following formula has been used with some success, particularly in that form of the disease which occurs in the West Indies. Take two table-spoonfuls of capsicum and two teaspoonfuls of salt; beat them into a paste, and add half a pint of boiling water. When cold, strain, and add half a pint of vinegar. Of this mixture, the dose for an adult is one tablespoonful every four hours. The quantity is to be diminished for children, according to age or the severity of the attack. The same formula forms an excellent gargle in the sore throat which accompanies the disease.

629. *In Cynanche Maligna, or Putrid Sore Throat*, ♏xxx. of tincture of capsicum added to Oss. of port wine, forms an excellent stimulating gargle. *In many other forms of Sore Throat*, a gargle of the tincture (♏lx.) and decoction of cinchona (fl. ℥vj.–viij.) sweetened with honey, proves very useful. Dr. Graves recommends a similar gargle in *Hoarseness depending upon a relaxed or weakened condition of the Chordæ Vocales.*

630. *In Subacute and Chronic Rheumatism*, Dr. A. D. Macdonald[1] speaks highly of the value of an ointment composed of powdered capsicum (℥ij.) and lard (℥j.), rubbed on the affected part by a gloved hand for ten minutes night and morning, or at bedtime only. The first thorough application often gives marked relief. Another mode of application is used by Mr. H. Buck.[2] He infuses a large handful of bruised capsicum in a pint of hot or cold water for thirty-six hours; a piece of lint soaked in this is placed over the affected part and covered with thin gutta-percha. This causes no vesication, but affords speedy relief in recent *Lumbago, Neuralgia, Toothache, Rheumatic Pains*, and *Torticollis.* In the last-named, its effects are often very striking.

631. *In Atonic Dyspepsia*, especially that occurring in hard drinkers, and in that of persons who have been long resident in hot climates, capsicum is a very eligible stimulant and stomachic. The following pills may be employed with advantage, two being taken daily an hour before dinner:—℞ Pulv. Capsici gr. ij.–iij., Pil. Rhei Co. gr. v., Pulv. Ipecac. Rad. gr. ss, M. ft. pil. ij. *In Diarrhœa arising from putrid matters in the Intestines, and especially when it is occasioned by fish*, Dr. Copland regards capsicum as almost a specific.

632. *In Yellow Fever*, Dr. Wright speaks in high terms of capsicum, given internally, as a means of obviating the black vomit.

633. *In Delirium Tremens*, attention has been called to the efficacy of capsicum by Dr. Kinnear and Dr. Lyons, of Dublin, under whose care numerous cases have rapidly and completely yielded to

[1] Brit. Med. Journ. Feb. 10, 1883. [2] Ringer's Therap. p. 420.

capsicum in doses of gr. xx.–xxx., in the form of bolus. The greatest improvement was often manifest after a single dose, especially when given early in the attack. It is generally given alone without the aid of other stimulants or opium. Dr. Lyons considers that it acts by the direct influence it exerts upon the gastric expansions of the vagi, and so indirectly upon the cerebro-spinal centres. Two cases illustrating forcibly the power of capsicum in severe cases of delirium tremens are related by Dr. B. Crowther,[1] of Hobart Town. He employed the tincture in ʒss. doses every three hours. Its beneficial effects, by inducing sleep, were speedily evident. Dr. Ringer (p. 420) endorses Dr. Lyons' recommendation of capsicum in *Dipsomania*, and adds that the tincture in ♏x. doses obviates the morning vomiting, removes the sinking at the pit of the stomach, the intense craving for stimulants, and promotes appetite and digestion. It should be taken shortly before meals, or whenever there is depression and craving for alcohol. Capsicum, he adds, is often useful to dipsomaniacs, to enable them to overcome their pernicious habit. *In the Delirium and Coma of Fever, and in Apoplexy*, capsicum cataplasms to the feet act as powerful and excellent revulsives. If kept on too long, they will cause vesication.

634. *To Unbroken Chilblains*, the tincture rubbed on gently till it produces strong tingling is with some a favourite application: it should be continued daily till recovery. A dossil of lint or cotton dipped into the tincture is an excellent remedy for *Toothache*.

635. Carbo Animalis, Animal Charcoal, Bone Black.
Carbo Animalis Purificatus. Purified Animal Charcoal.

Med. Prop. and Action. Used in pharmacy as a decolorizing agent. Like wood charcoal, it may be employed as a deodorizer and antiseptic. In poisoning by morphia, strychnia, aconitia, and other alkaloids, and also by corrosive sublimate, arsenic, and some other mineral poisons, animal charcoal was brought forward as an antidote by Dr. Garrod in 1846; but it is now generally admitted that any antidotal power it may possess is purely mechanical, by absorbing the poisonous particles, thereby preventing their coming in immediate contact with the gastric surface, and impeding consequently their absorption into the system. Half an ounce is said to be required for every grain of the alkaloid, but as the charcoal is in itself perfectly innocuous the proportion may be greatly increased with safety and advantage. It should be given mixed with water as hot as the patient can swallow, as its action is much aided by an elevated temperature.

636. Carbo Ligni. Wood Charcoal. Wood charred by exposure to a red heat without access of air.

Med. Prop. and Action. Antiseptic, disinfectant, and deodorant. In a minor degree, it appears to be tonic and febrifuge. When taken internally, it is said to be absorbed into the system; Prof. Oesterlen discovered it in the blood of the mesenteric veins and the vena porta, and in the liver and the lungs of

[1] Lancet, Jan. 25, 1879.

animals which had been fed on food containing it. The surface of the intestinal canal was found perfectly healthy. Ebenhard also detected its presence in various parts of the body; but M. Mialhe failed to discover it. It is much used as a tooth-powder and in the construction of respirators. Externally, powdered charcoal (℥ss.) mixed with linseed meal (℥jss.), forms an excellent poultice to gangrenous and foul ulcers. The many valuable purposes to which charcoal may be applied as a deodorant and disinfectant have been fully pointed out by Dr. J. Bird, Dr. Stenhouse,[1] and others.

Dose:—Of Wood Charcoal, gr. xx.–gr. lx. or more. Bragg's Charcoal Biscuits (each containing 10 grs.), and Belloc's Lozenges or Gelatine Capsules (grs. iv. in each), are eligible forms of administration.

637. *Therapeutic Uses. In Dyspepsia attended with obstinate Flatulence and Gastrodynia*, charcoal was formerly much employed, but it fell into disuse. In 1849, M. Belloc again called attention to its efficacy; he found it successful in many instances when bismuth, iron, and lead had failed. He advised it in doses of a dessert-spoonful after each meal. Dr. Leared's observations[2] on the use of charcoal in this class of diseases tend to show—(1) that its efficacy in these cases depends solely on its gas-absorbent property; (2) that charcoal, made from the most solid vegetable substances, is greatly superior as a gas absorbent to that made from the lighter kinds—like Belloc's preparation—and that made from vegetable ivory is the best; (3) that the absorbent power of charcoal is slightly weakened by pulverization, is much impaired by exposure to the atmosphere and damp, or by soaking in water, and is altogether impeded by being covered with water; 4, that to be effective against gastric flatulence, it must be introduced into the stomach in the same state as when fresh from the crucible; to effect this, the freshly prepared charcoal should be at once enclosed in gelatine capsules, each of which will contain gr. x. of the heavy vegetable ivory charcoal. Of these two (gr. xx.) are a sufficient dose in ordinary cases. The large nauseous doses prescribed by Belloc are thus obviated.

638. *In Puerperal Fever, for the relief of the Flatulence*, which is often a distressing sympton, Dr. Matthews Duncan[3] states that one of the remedies he has found most useful is charcoal in teaspoon doses, given in water once or twice a day.

639. *To Foul and Gangrenous Ulcerations*, a charcoal poultice (a common linseed poultice to which charcoal is added) is highly serviceable in correcting the fetor of the discharge, and in arresting the progress of the ulceration. *In Gangrene and Phagedæna*, it is a valuable application.

640. Carbolic Acid. Acidum Carbolicum. Phenic Acid.

Med. Prop. and Action. In the pure state, caustic; diluted, rubefacient, anæsthetic, and antiseptic; internally administered, carminative and sedative, closely resembling kreasote in its power of allaying vomiting and gastric irritability. The principal effects noticed by Dr. Keith induced by its internal administration in a large number of cases were—(*a*) profuse perspiration; (*b*) reduction of the heart's action, the pulse falling within a few hours from

[1] Ranking's Abstract, vol. xxi. p. 1.
[2] On Imperfect Digestion, 1870.
[3] Lancet, Nov. 6, 1880.

120 to 60: and (*c*) in some cases a smoky appearance of the urine. Amongst other effects of the internal administration of carbolic acid noted by Dr. Bill[1] are a loss of sensibility of the mouth and throat, or a feeling of numbness, as when aconite is applied to the lips; nausea with abdominal uneasiness, slight vertigo, ringing in the ears and partial deafness, and occasionally diarrhœa. Feebleness of heart-beat, muscular debility, and loss of flesh follow its long-continued use. The temperature was unaffected. It is rapidly absorbed and quickly and entirely given off by the urine, to which it imparts a peculiar greenish-black hue, and its own-peculiar smell. (Farquharson.) Its powers as a disinfecting and deodorizing agent are very marked. A very small quantity added to stinking urine or fetid evacuations rapidly and completely removes the smell. Its antiseptic powers are no less striking. If it be added in a very small proportion to freshly voided urine, it will keep for a long period in an unchanged state. In fact, it has a specific influence on all organic and inorganic matter, retarding or preventing the process of putrefaction. It proves fatal to all the lower forms of animal and vegetable life. We shall have occasion subsequently to notice several modes in which it is employed for this purpose; for general use the best form is the Glycerine of Carbolic Acid, B. Ph., which is prepared by triturating together Carbolic Acid (ʒj.) and Glycerine (fl. ʒiv.) until the acid is dissolved. *Calvert's Disinfecting Fluid* is a solution of carbolic acid.

641. *In the "Antiseptic Treatment" in Surgery*, carbolic acid holds a foremost place. Its advantages are set forth by Sir Joseph Lister. In the first place, it possesses the essential requisite of being a most potent poison to all the low forms of life which determine putrefaction, and it retains this power even when diluted to such a degree as to be almost entirely unirritating to the tissues of the human body. In the second place, it is volatile, and its vapour is also efficacious as an antiseptic. This gives it a great advantage over chloride of zinc, or any other non-volatile substance, enabling the dressings impregnated with the acid to exert their influence not only upon objects in actual contact with them, but also upon their vicinity. Again, carbolic acid is a local anæsthetic, and exercises a most soothing influence upon a painful wound. Lastly, the acid is soluble in a variety of liquids of different properties, as different, for example, as water and oil, and each of the solutions has its own special value in practice. Dr. J. R. Wolfe, of Aberdeen, to whom is due the priority of employing this agent in this country, observes that the only objection to carbolic acid is its strong and rather disagreeable smell. To obviate this, he advises that cotton wool should be saturated in the pure acid, and then pressed to get rid of the excess of acid, and then dried and kept in a closely covered vessel. Sufficient acid remains in the cotton wool to act upon the wound without leaving enough to make the smell disagreeable. Mr. E. Gutteridge[2] relates some cases of *Compound Fractures*, *Wounds*, and *Burns*, strikingly benefited by carbolized oil —1 of the acid to 4 of boiled linseed oil.

642. *Mode of Application.* The following directions, abridged, were furnished by Sir Joseph Lister[3] for the use of surgeons engaged in the Franco-Prussian war. Wash the wound thoroughly and also the surrounding skin with a saturated solution of the crystallized acid (1 to 20 of water), introducing the fluid by means of a syringe, and manipulating the parts freely so as to cause the lotion to penetrate into all the interstices of the wound, and at the same time squeeze out such clots of blood as it may contain. The fluid should be introduced repeatedly to insure its thorough penetration. In following this direction caution is needed, since if force be used, the connective tissue spaces will be injected, and the irritation of the carbolic acid will give rise to extensive suppuration and sloughing. The bleeding vessels should be tied with antiseptic catgut, or occluded by torsion; when a ligature is indispensable, silk or whip-cord previously steeped in a strong oily solution of the acid is used.

[1] American Journ. Med. Sci. July 1872.
[2] Lancet, Nov. 20, 1869.
[3] Brit. Med. Journ. Sept. 3, 1870.

When the catgut is employed the ends should be cut close to the knot; but when silk or whip-cord is used the ends should be left projecting at the wound. Where sutures are required, catgut or wire, or in their absence, silk steeped in an oily solution of the acid, should be used. While the antiseptic lotion is in the wound all foreign matters should be, as far as possible, removed. Then place upon the wound two or three layers of oiled silk smeared on both sides with a solution of the acid, in five parts of any of the fixed oils—almond olive, linseed, &c.—the oiled silk being made large enough to cover the raw surface completely, and slightly overlap the surrounding skin. Next apply, without loss of time, lint, charpie, or cloth (linen or cotton) well steeped in the oily solution of the acid, the cloth or lint being folded sufficiently to produce a layer at least a quarter of an inch in thickness, and extending a considerable distance—say three inches beyond the oiled silk in all directions, the outer layer being made somewhat larger than the rest, so that the margin of the mass of cloth may be thin. Cover the oily cloth with a piece of thin gutta-percha tissue, sufficiently large to overlap it on all sides by an inch or more, and retain it securely in position by a roller steeped in the antiseptic oil. Round this again wrap a still larger piece of folded cloth, say a folded towel also steeped in the oil, and cover the whole with a piece of oiled silk or gutta-percha. The time for changing the outer cloth or treating it with fresh oil must be regulated by the amount of discharge. During the first 24 hours the effusion of blood and serum is necessarily profuse, and fresh oil should be applied to the outer cloth within 12 hours of the first dressing, or even in 6 hours, if there should be unusual oozing. On the second day, also, in the case of a large wound, two dressings in the 24 hours are desirable. After this, if all go well, the discharge will diminish quickly, and a daily renewal of the oil will suffice ; and after 5 or 6 days it may be applied once in 2 days. It should, however, be continued after the discharge has ceased entirely till sufficient time has passed to insure that the wound has healed by scabbing, or at least has been converted into a superficial sore. The changing of the outer cloth requires care in order to avoid raising the edge of the gutta-percha along with it, and so admitting septic air towards the wound. It may be done with perfect security, by having the cloth consist of two parts, one covering each half of the gutta-percha, and as one-half is raised throwing a stream of watery solution (1 to 40) with a syringe upon the margin of the gutta-percha, a fresh oiled cloth being at once applied before the other portion of the former cloth is removed. If sufficient time cannot be spared for changing the outer cloth in this careful manner, it will be better to pour fresh oily solution upon the exterior of the cloth without disturbing it, taking care that the oil enter well beneath its margin. This plan is advisable where a large number of wounded have to be treated by one surgeon. The strong oily solution (1 to 5) would irritate the skin, if used continuously; after the first dressing, a weaker solution (1 to 10) suffices, and after a few days the strength may be reduced to 1 to 20 if excoriation should occur. The more recent practice of "Listerism" consists of the use of a carbolic acid spray (1 in 20, diluted by the steam to 1 in 40), while carbolized oil catgut (by preference that prepared in chromic acid) is used for ligation of arteries. The dressing in vogue is (1) specially prepared oil silk as protective from irritation of the spray ; (2) gauze—*i.e.*, coarse gauze impregnated with carbolic acid dissolved in paraffine and resin; (3) Jaconet; and the whole maintained in place by gauze bandages and elastic bands. All instruments and the hands of operators to be washed in 1 in 40 carbolic lotion. The earlier the case comes under treatment, the greater will be the prospect of success, but even after the lapse of 36 hours it need not be altogether despaired of. In the case of *Compound fractures*, the essential objects of the treatment may be attained by using splints constructed of stout iron wire bent into the form of the margin of a lateral splint, and strengthened by cross pieces here and there. Such splints can be readily extemporized by the surgeon himself, by help of two pairs of wire-forceps. The splints should be applied one at each side of the limb, without any padding opposite the seat of injury except the dressing above described, but padded elsewhere with any suitable soft

material, an interval being left between such padding and the dressing. The outer layer of oiled-silk or gutta-percha should be applied outside the splints, so that all that will be requisite in order to apply oil to the outer cloth will be to take off the oiled silk with its retaining bandage, and pour on the oil through the ample spaces between the wires. Or the splints might be applied immediately external to the bandage that retains the deeper layer of gutta-percha, leaving the outer cloth to be wrapped round external to the splints; cotton or charpie, imbued with the antiseptic oil, being tucked in under the splints to keep the margins of the gutta-percha in apposition with the limb, the cotton being changed as often as the cloth itself. For the sake of the general healthiness of the atmosphere of the crowded military hospitals, it is extremely desirable that even superficial granulating sores should be treated antiseptically. This may be done consistently with rapid healing by washing the sore with watery solution of carbolic acid (1 to 20), and covering it with two or three layers of oiled silk smeared with the oily solution (1 to 20), with well-overlapping folded cloth steeped in similar oil, and over all a piece of gutta-percha tissue and bandage. Listerism is not without its defects and dangers. Dr. M'Phail [1] has pointed out that toxic effects may and do sometimes arise from the use of carbolized dressing; and Dr. Bantock [2] throws much doubt on the alleged advantages and safety of the system; but the statistics of Sir Spencer Wells [3] establish the fact, that in ovariotomy, at any rate in his practice, the ratio of deaths is far less in those cases which were treated antiseptically than in others.

643. *In Carbolic Acid Poisoning*, first remove the poison from the stomach as speedily as possible by means of copious draughts of warm water, or of mustard and water, followed by draughts containing glycerine, with water and sulphate of zinc. From the action of the acid on the mucous coat of the stomach, the stomach-pump should be employed with great care, and probably would often be inadmissible. No chemical antidote is known; but eggs, largely diluted, being whipped up with milk or cold water and powdered raw meat, are likely to prove of service. Oils and oleaginous mixtures are of very doubtful propriety. Collapse must be treated on general principles, but as brandy dissolves carbolic acid, and is itself speedily absorbed, its administration by the stomach is contra-indicated. Stimulants are best exhibited per rectum. (Mr. Roberts.[4])

The application of large quantities of carbolic acid to an extensive surface is not unattended with danger. Three interesting cases of poisoning, two of them fatal, by the absorption of this acid, which had by mistake been used instead of "sulphur lotion," are recorded by Mr. E. S. Machin.[5] About ʒvj. of Calvert's Disinfecting Solution had been employed. Caution is therefore necessary in its use as an external application.

Doses and Preparations. The glycerine of carbolic acid of the B. Ph. is a very useful preparation; it is of a strength of 1 in 4½. This is too strong for local application. In this state it can be equally diluted to any degree of strength. In general *the dose* of carbolic acid is gr. j. in fʒj. of water. Its nauseous taste may be disguised by Ol. Menth. Pip. or Essence of Lemon. As a *gargle*, gr. i.–ij. Aq. fʒj. *As an Injection*, gr. j. Aq. fʒj. *As a Lotion*, gr. xv. Aq. fʒj. *As an Ointment*, gr. xvj. Adeps Benzoat. ʒj. *As a Liniment*, 1 part to 20 parts of olive oil. *As a Plaster*, 1 part to 3 parts of shellac. *Antiseptic Oil for Abscesses*, 1 part to 4 parts of boiled linseed oil. *Antiseptic Putty*, six spoonfuls of the antiseptic oil mixed with whiting.[6]

For disinfecting purposes generally, one pound of *crystals* to six gallons of water. *Fluid*, 1 part to 80 parts of water. *Powder*, 1 oz. of crystals to 4 lbs. of slaked lime. *For disinfecting sick-rooms*, place a portion of the dissolved crystals in a porcelain dish and float it in a larger dish of hot water. *For drains*, one pound of fluid carbolic acid to five gallons of warm water. (*Ibid.*)

[1] Edin. Med. Journ. Aug. 1881.
[2] Med.-Chir. Trans. 1881, p. 103.
[3] Med.-Chir. Trans. 1881, p. 167.
[4] Brit. Med. Journ. May 27, 1871.
[5] Brit. Med. Journ. March 7, 1868.
[6] Pharm. Journal, 1870; Braithwaite's Retrosp. lxiii. p. 273.

644. *Therapeutic Uses.* As a local anæsthetic it has been turned to practical account by Dr. J. H. Bill[1] (U.S. Army), who opened under its application abscesses, whitlows, and buboes in a painless manner. The pure carbolic acid is useful as a caustic for *Gonorrhœal Warts*, as it acts also as a local anæsthetic.

645. *In Pyœmia and Septicœmia*, the value of a carbolized atmosphere in the treatment of *Pyœmic and Erysipelatous Blood Poisoning*, and also as a prophylactic agent after operations, is forcibly pointed out by Prof. J. Wood.[2] For this purpose he employs MacDougall's Disinfecting Powder placed in small thin muslin bags suspended from the ribs of a fracture cradle, or on the bed near and around the wound. He also spreads it freely under and around the bed in all *putrefying and infectious cases*, and the floors are washed with a solution of common carbolic acid, so as to pervade the atmosphere very sensibly. Its action appears to be equally marked and beneficial in resisting septic influences.

646. *In Scarlatina, Measles, and Small-pox*, Dr. A. Keith[3] has administered carbolic acid internally in several hundred cases with decided advantage. It was found more useful at an early stage of the disease, although, given afterwards, it much modified the symptoms and hastened the curative process. He employed the following mixture:—℞ Acid. Carbolic., Acid. Acetic. āā f℥j.–℥jss., T. Opii f℥j., Spt. Chloroformi f℥j., Aquæ ad ℥viij. Dose, a tablespoonful every four hours till the fever subsides. After the first dose this mixture was rather grateful to the patient than otherwise.

647. *For Scarlatinal Sore Throat*, the gargle advised in diphtheria (*infra*) may be advantageously employed. Mr. Beardsley[4] has recorded some circumstances which seem to indicate that carbolic acid may exercise influence as a *prophylactic against Scarlet Fever.* The patient was systematically sponged with a solution of the acid (fl. ℥j., Aq. Oj.), and the rest of the household added the acid to their washing water. The disease did not spread.

648. *In Diphtheria*, Mr. C. Sedgwick speaks highly of the following formula, used as a gargle by adults, but applied by means of a sponge to the throat in children: ℞ Acid. Carbol. ♏xx., Acid. Acetic. ♏xxx., Mellis ℥ij., T. Myrrhæ f℥ij., Aq. ad ℥vj. M. The acids should first be mixed together, and the other articles added gradually. He considers that this has a decided effect on the exudation. He has found it equally useful *in Ulcerated Tonsils.*

649. *In Chronic Laryngitis*, where there is long-standing hyperæmia, with diminished secretion—where the mucous membrane looks dry and shining—the remedy which Dr. Morell Mackenzie (p. 289) states he has found most successful is carbolic acid (℥j.–ij. of the pure white carbolic acid to ℥j. of glycerine).

[1] Amer. Journ. Med. Sci. Oct. 1870.
[2] Practitioner, Jan. 1871.
[3] Lancet, Jan. 23, 1869.
[4] Practitioner, Feb. 1869.

650. *In Phthisis*, carbolized inhalations were first proposed by Dr. Marcet,[1] and the later observations of Dr. R. Munro,[2] Dr. Coghill,[3] Dr. G. H. Mackenzie,[4] and others tend to prove that not in phthisis alone, but in many other chest affections—*e.g.*, *Chronic Bronchitis with profuse expectoration*, *Pertussis*, *Catarrh*, *Gangrene of the Lungs*—they may be used with manifest advantage. The inhalation may be effected in three ways:—1. By inhaling the steam of a mixture of carbolic acid and hot water (℥j. to Oj.) by means of an inhaler or jug. 2. By habitually wearing a Mackenzie respirator, containing a sponge saturated with a strong solution of the acid; and 3. By establishing a carbolized atmosphere in the apartments commonly used. By the two latter modes continuous inhalation is kept up which is very desirable. They are not intended to supersede other constitutional or local remedies. In the after-treatment of paracentesis for *Empyema*, Mr. J. Wood[5] speaks of a solution of carbolic acid or some of its preparations as the most generally useful and effective application.

651. *In Diabetes*, carbolic acid was introduced as a remedy by Drs. Ebstein and Julius Müller,[6] of Breslau; but Dr. Shingleton Smith,[7] states that numerous observations have shown no good results from its use.

652. *In Small-pox*, the value of carbolic acid as an external application was first brought prominently to notice by Dr. R. Bell,[8] of Glasgow. He employed a mixture of 1 part of the acid and 11 or 15 parts of glycerine night and morning over every part of the skin affected with the eruption, commencing from the very beginning of the attack. By this means, he remarks, the comfort of the patient is at once secured, the skin rendered less irritable, the fever is in consequence kept down, the strength remains unimpaired, the patient is able to sleep and take nourishment; in short, to pass through the whole course of the attack with the minimum of discomfort. In addition to this the acid acts as a disinfectant and prevents pitting to a very great extent. The urine should be carefully watched, as it often happens that the acid becomes absorbed, and makes its presence known by the urine assuming a dark, smoky appearance, when the application should be made less frequently, or a weaker solution used. My friend, Dr. Aitchison, has used this treatment largely in India for some years with the best results, only substituting sweet oil for glycerine (1 part to 10). It relieves the patient marvellously, he says, the oil soothing and cooling the skin, the acid deodorizing the stench and destroying the contagious influence of the particles thrown off by the skin. The oil is as much part of the treatment as the disinfectant. Its efficacy in preventing *pitting* is testified to by Dr. H. Yates,[9] Dr.

[1] Practitioner, Nov. 1868.
[2] Glasgow Med. Journ. Oct. 1880.
[3] Brit. Med. Journ. May 28, 1881.
[4] Brit. Med. Journ. Nov. 19, 1881.
[5] Lancet, May 7, 1874.
[6] Berlin Klin. Woch. Dec. 8, 1873.
[7] Brit. Med. Journ. June 24, 1882.
[8] Brit. Med. Journ. Nov. 25, 1876.
[9] Lancet, Feb. 25, 1868.

Scott, of Dumfries,[1] Mr. C. W. Thorp,[2] and Mr. Thorburn Paterson,[3] who specially recommends the following ointment :—℞ Acid. Carbol. gutt. xx.–xxx. Glycerin. ʒjss. Ung. Zinci Oxid. ʒvj. M. To be freely painted over the hands and face every day, or every other day with a camel-hair brush. This ointment has also been found very useful when the *pustules of vaccinea take on an erysipelatous action;* this it speedily subdues.

653. *In Chronic Uterine Catarrh, accompanied with secondary morbid states of the Uterus and Cervix,* such as *Hypertrophy, Congestion,* &c., which have resisted ordinary means, Dr. W. Playfair,[4] advocates intra-uterine medication, and for this purpose, one of the safest and most reliable forms which he generally uses is a mixture of equal parts of crystalline carbolic acid and glycerine. This is a powerful alterative, causing shrinking and mummification of the tissues without producing an eschar; it is therefore free from all risk of producing cicatricial contraction. Its use should be limited to the first ten days after menstruation. Two applications at intervals of three or four days are quite as effectual as a larger number, and much less irksome to the patient. (Playfair.[5])

654. *In Typhoid Fever,* the antiseptic treatment by a combination of carbolic acid and iodine was introduced with strong assurance of its efficacy by Dr. Rothe.[6] He prescribed it as follows :—Carbolic acid (1 to 2), tincture of iodine (i.), and water (120), in doses of a tablespoonful every hour until it produced a decided effect on the pulse and temperature, and then every two hours until apyrexia followed, after which it should be continued for three or four weeks. Dr. C. E. Shelly[7] tried this treatment in a modified form with satisfactory results. The formula he employed was Carbolic Acid ♏j.–ij., Tinct. of Iodine ♏j.–iij., Syrup ʒss., and Lemon Water ℥j. This was repeated every two, three, or four hours, according to circumstances. Dr. F. W. Warren[8] reports highly of carbolic acid given alone in large doses freely diluted—ʒss.–ʒj. daily in ordinary drink or abundance of water. It evidently acts, he remarks, as an antiseptic and also as a nervine tonic, accelerating the healing and cicatrization of the intestinal ulcers. Small doses he regards of little or no value. In the Typhoid of Algeria, M. Ramouet[9] obtained excellent results from carbolized enemas, each containing one gramme (15 gr.) of crystallized carbolic acid in 150 grammes of water at the temperature of the room : 1, 2, or 3 enemas daily, according to the severity of the case. A few drops of laudanum sometimes added to help the retention of the enema.

655. *In Intermittent Fever,* Dr. Treulich[10] succeeded in curing with carbolic acid eight cases which had resisted quinine. The average dose was about gr. iv. in infusion of ginger.

1 Edin. Med. Journ. Aug. 1871.
2 Brit. Med. Journ. Jan. 14, 1882.
3 Lancet, Aug. 24, 1878.
4 Lancet, July 2, 1871.
5 Brit. Med. Journ. March 27, 1880.
6 Lon. Med. Record, Aug. 1880.
7 Brit. Med. Journ. April 9, 1881.
8 Med. Press, Jan. 11, 1882.
9 Lancet, Sept. 30, 1882.
10 Wien. Med. Prague, July 2, 1871.

656. *In Pyrosis*, Dr. Podmore Jones employed this acid in twelve cases, and in each with satisfactory results. He prescribes a solution of the crystallized acid (gr. j., Spt. Vin. Rect. ʒj.) in doses of gutt. xv. in a wineglassful of water, an hour before each meal. He considers that it acts by destroying those vegetable organisms on which this affection appears to depend; be that as it may, it appears to be an effectual remedy. *In Dyspepsia attended with Flatulence, Eructations, &c., in Hæmorrhagic Ulcer of the Stomach*, and in *Chronic Gastric Catarrh*, Dr. J. Allen found the internal administration of carbolic acid of great service. He likewise found it useful in the form of injection in *Mucous Diarrhœa*. *In Gastric Irritability*, especially when due to miasma or sewage exhalations, it proved most serviceable in the hands of Dr. Godfrey; and in *Cholera* it is stated to have proved very successful.

657. *In Chronic Cystitis*, when the urine is offensive, Sir H. Thompson (p. 150) advises an injection of carbolic acid, ♏j.–ij. to ʒiv. of warm water. *In Gonorrhœa*, Mr. Ashmead[1] successfully employed the following injection:—℞ Acid. Carbol., Acid. Tannic. āā gr. viij., Glycerin. ʒss. Aq. ad ʒj. M. It appeared to act as an antiseptic, arresting the discharge and cutting short the disease. The editors of Braithwaite's "Retrospect" (vol. lxiv. p. xxxii.) bear testimony to the value of this combination, though not quite of the strength recommended.

658. *As a preventive of Puerperal Fever*, Dr. J. G. Wilson speaks favourably of the practice of intra-uterine injections of a weak carbolic acid solution, which not only removes offensive coagula, &c., but acts in virtue of its antiseptic property. The practice is spoken highly of by Dr. Matthews Duncan.[2] He employs a weak solution (1 in 40 or 1 in 30), tepid or warm. Ordinarily 1 or 1½ pint of the lotion suffices, but if the discharge be copious, more may be required; it must be continued as long as any fetor is perceptible.

659. *In Chronic Inflammation and Ulceration of the Os and Cervix Uteri*, it is highly spoken of by Dr. Lloyd Roberts as a local application. He considers that as an escharotic in these cases it holds a mid-place between nitrate of silver and caustic potash. Care must be taken not to touch the vaginal mucous membrane with the acid, as it causes excoriation and much pain. In addition to its use as a caustic, he employs the following lotion as a healer and disinfectant:—℞ Acid. Carbol. ʒj.–ij., Glycerini ʒj., Aq. Oj. M. *In Cancer of the Uterus*, Dr. W. Playfair has found great benefit from a mixture of glycerine, tannin, and carbolic acid, in equal parts, applied on a pledget of cotton wool to the ulcerated surface. This was drawn out of the vagina with a string, and re-soaked twice a week, and the vagina was also washed out twice daily with a tablespoonful of the mixture in a pint of water. Great benefit, local and constitutional, followed this treatment.

[1] Lancet, Dec. 16, 1871. [2] Lancet, Nov. 6, 1880.

660. *Piles* successfully treated by carbolic acid injections are recorded by Dr. F. W. Warren[1] and others. This treatment is only adapted to internal piles, and requires further facts to establish its superiority to ordinary modes of cure.

661. *To poisoned Wounds*, Dr. Wolfe suggests the immediate application of the pure acid. Dr. McRae[2] found it afford immediate relief in the *Stings of Bees and Wasps*, when injected into the punctures. It would be worth a trial in scorpion and centipede bites, and even in those of venomous snakes; but to be of any effect, the application must follow immediately after the infliction of the injury.

662. *For Foul and Ill-conditioned Ulcers*, few applications are more generally useful than a solution of carbolic acid. My friend Dr. Aitchison informs me that in his Indian practice he has for years discarded water dressing in any form to ulcers, and has substituted for it a mixture of 1 part of carbolic acid and 10 of sweet oil. He pronounces this to be a far more effectual mode of treatment.

663. *In Primary Syphilis*, the local application of the acid is favourably noticed by Mr. Holmes Coote; he employed it both pure and diluted with equal parts of water. The trials with it, *in Syphilitic Affections*, by Dr. R. Sigmund,[3] yielded only negative results. *Phagedœnic Chancres*, after the removal of the sloughs, should be cleansed with carbolic acid lotion (1 in 20). (Hill and Cooper, p. 487.) *For Buboes*, Dr. J. Lamprey advocates the plan of making a small vertical incision in the centre of the suppurating gland, just large enough to allow of the free escape of the pus, and then injecting with a common glass syringe a solution of carbolic acid (1 part) and water (10 parts). After remaining in a few seconds only, it should be squeezed out of the sac by gentle pressure. The pain it causes soon passes off. The injection is repeated in three days, and in the meantime the bubo should be kept covered with lint soaked in a weak solution (1 to 40). Care must be taken to protect the surrounding parts.

664. *To Cancerous Ulcerations*, Dr. J. Barclay employed in four cases the following lotion:—℞ Acid. Carbol. ʒjss.–ʒij., Spt. Vini Rect. ʒj., Aquæ ad Oij. M. Compared with acetic and citric acids, which he employed in other cases, he draws the following conclusions:—1. That they have about an equal effect in removing pain in cancerous growths. 2. That carbolic acid has a powerful effect in removing the offensive fetor. 3. That they all have a solvent effect on cancerous tissue; citric acid the least, acetic acid next in degree, and carbolic acid most powerful. The above lotion may prove serviceable *in Gangrenous and other ill-conditioned Ulcers*, attended by copious or offensive discharges. *Carbuncles and Boils*, according to the experience of Dr, P. Eade,[4] may almost invariably be averted in the early stage, or if that stage has passed,

[1] Med. Press, Jan. 11, 1882.
[2] Brit. Med. Journ. April 13, 1872.
[3] Practitioner, July 1872.
[4] Brit. Med. Journ. July 1, 1876.

may be arrested, or their course greatly modified by the free application of a strong solution of carbolic acid (4 or 5 to 1 of glycerine), but for this purpose the acid must be freely introduced into the central part of the diseased mass, and also into every other part where an opening exists. No ill effect, beyond darkening of the urine, was ever observed. Dr. C. Taylor[1] has successfully treated carbuncles by injecting into their substance, by means of an ordinary hypodermic syringe, 5 or 6 drops of pure fluid carbolic acid. Poultices, fomentations, and constitutional means were also used as required. *To Poisoned Wounds*, Dr. Wolfe suggests the immediate application of the pure acid.

665. *To Burns*, the addition of carbolic acid to Lin. Calcis (1 part to 30) has been found most serviceable by Dr. Allan Wilson. Prof. Pirrie, of Aberdeen, used a stronger solution (1 of acid to 6 of olive oil), and he found it not only afford speedy relief to pain, but promoted the healing process without suppuration. Dr. Aitchison informs me that he has for years used a solution of the acid in oil (1 to 10) with the best results. It certainly seems worthy of further trial.

666. *In Diseases of the Gums*, Mr. Hilditch[2] advises, after washing the teeth night and morning with a soft tooth-brush, the application to the affected part of a little of the following lotion:— ℞ Acid. Carbol. gr. xx., Spt. Vini Rect. ʒij., Aq. Dest. ʒvj. M. Under its use the gums soon get firmer and less tender. *In Fetor of the Breath arising from carious teeth, smoking, &c.*, washing the mouth out with a weak solution of carbolic acid acts as a good deodorizer, though inferior perhaps to the permanganate of potash. *Obstinate Ulceration of the Throat, accompanied by fetor of breath*, will sometimes yield to the application in the form of spray, of the dilute acid (♏xv. Aq. ad ʒj.), or it may be used simply as an inhalation. (Dr. Beigel.[3]) *In all Fetid Discharges from the Mouth, Throat, Nostrils, Ears*, and other parts, a weak aqueous solution of the glycerine of carbolic acid may be used with advantage.

667. *In Tinea, Pityriasis*, and *other Skin Diseases of vegetable parasitic origin*, carbolic acid is a remedy of great power, and where the affection is limited in extent and of recent origin, a single painting with pure carbolic acid, to use the words of Dr. Liveing[4] with reference to *Ringworm*, is thoroughly effective, but it is a strong remedy, and gives much pain. When the disease extends over a large surface, milder measures must be used. The best remedy for preventing its spreading amongst children is carbolized glycerine, B. Ph., either pure or diluted, with a little more glycerine well rubbed all over the scalp every morning. This acts in two ways:—1. The carbolic acid produces its usual effect on organized matter; and 2. the glycerine prevents particles of scurf from being dispersed. Its unpleasant odour is its chief objection. Dr. R.

[1] Practitioner, Sept. 1882.
[2] Lancet, March 14, 1868.
[3] Practitioner, Aug. 1868.
[4] Lancet, Nov. 1, 1879.

Lee[1] gives the following as the most effective application:—℞ Sulph. Precip. Zinci Oxid. āā ʒj., Ol. Oliv. fʒj., Acid. Carbol. gr. xvj. M. To be applied by means of a brush or sponge every four or six hours. *In Eczema*, *Prurigo*, and *Lichen*, Dr. Thornley[2] used with success the following lotion:—℞ Acid. Carbol. ʒjss. Glycerin. ʒs., Aq. ad ʒvj. M. Carbolic acid soap was used daily at the same time. *In Eczema of the Vulva*, Dr. West (p. 642) recommends the following:—℞ Glycerin. Carbol. (B. Ph.) ʒiij., Aq. ad ʒx. M. ft. lotio. *In Psoriasis*, Dr. McNab[3] used with advantage an ointment, Carbolic Acid (1 to 4 of lard); and Dr. Allan states that in this affection as well as in *Pityriasis* and *Prurigo*, good results have followed its internal administration, gr. j. in the form of pill six times daily: the Sulpho-Carbolate of Sodium (*q.v.*) would probably be a preferable form of administration. *In Erysipelas*, the subcutaneous injection of carbolic acid proved successful in the hands of Dr. Aufrecht of Magdeburg.[4] Cases of *Nævus* cured by injection of carbolic acid are recorded by Mr. Porter[5] and Mr. Bradley[6] of Manchester. *Warts* may be removed by touching them every other day with carbolic acid. Care should be taken to protect the surrounding parts. A weak solution (1 to 100) is said to be very effectual in relieving *Pruritus Ani*.

668. *In Leprosy*, the treatment by carbolized vapour baths, introduced by Dr. W. Johnson,[7] Surgeon-general, Madras Army, promises good results, and is well worthy of further trials. All that is required is an ordinary vapour-bath apparatus, within which the patient sits, with his head protruding through the aperture at the top. Outside is a vessel of sufficient size to contain about a quart of fluid, with a curved spout, to fit accurately on an elastic tube, long enough to pass within the vapour-proof envelope. The calibre of this elastic tube should be such as to admit a continuous and abundant supply of the vapour as it comes from the vessel resting on a spirit-lamp having a flame sufficient to keep the fluid boiling briskly. Prior to the use of the bath, the body should be sponged with tepid water holding a piece of washing soda in solution, as this seems to aid the absorption of the vapour. The carbolic acid should be Calvert's Disinfecting Fluid, of which a mixture of 3 or 4 parts to 6 or 7 of water may be employed. In this vapour bath the patient should remain from thirty to sixty minutes, and it may be repeated every second or third day according to circumstances. No ill effects have ever been observed from the use of this carbolized aqueous vapour, even in cases presenting extensive ulcerated surfaces. Some care is requisite in arranging the fold or frill round the aperture through which the head protrudes. Were the patient to breathe a little of it, Dr. Johnson remarks, little injury, possibly good, would result, but

1 Brit. Med. Journ. July 21, 1877.
2 Med. Press, May 20, 1874.
3 Lancet, May 19, 1870.
4 Brit. Med. Journ. April 25, 1874.
5 Med. Press, Aug. 18, 1869.
6 Brit. Med. Journ. April 8, 1876.
7 Med. Times, June 3, 1882.

for obvious reasons he should not breathe too much. Dr. Aitchison directs leprous ulcers to be treated with a solution of carbolic acid (1 in 7 or 10 of oil), and the whole body to be rubbed with a weaker solution (1 in 20). He speaks highly of this treatment.

669. In *Scrofulous Ophthalmia*, Mr. Markey[1] recommends the following as an excellent collyrium:—℞ Acid. Carbol. gutt. j., Glycerini gutt. v., Aq. Rosæ ʒj. M.

670. *In Guinea Worm*, in order to expedite its extraction, Mr. J. Tufnell[2] advises that a silver probe, dipped in a mixture of carbolic acid and oil (1 to 3 parts), be passed up into the sinus as far as it will go, on each side of the worm. This will destroy the resisting power of the worm for a certain length, and by gentle traction it will come out freely. As soon as resistance is felt, the acid must be applied again, and a further portion extracted, and so on until the whole is removed. In this way a worm measuring 30 inches was extracted in about two hours.

671. Cardamomum. Cardamoms. Carui Fructus. Caraway. Caryophyllum. Cloves.

672. *Therapeutic Uses.* These substances are employed mainly as flavouring agents. They are carminative, and hence useful in flatulence, colic, &c.

Casca. See Erythrophlœum Guinense.

673. Cascarillæ Cortex. Cascarilla.

Med. Prop. and Action. Aromatic, bitter, and tonic. It is also a mild carminative, and has the advantage over the other medicines of the same class of not causing constipation.

674. *Therapeutic Uses. In Atonic Dyspepsia* and in *Debility* from whatever cause, particularly in that occurring after fever, the infusion of cascarilla is often productive of much benefit.

675. Catechu. Gum Catechu. Of this there are two kinds:—1. Catechu Nigrum, Black Catechu (Acacia Catechu, *Willd.*); 2. Catechu Pallidum, Pale Catechu (Uncaria Gambir, *Roxb.*).

Med. Prop. and Action. Powerful astringent. Of the two varieties chiefly met with in commerce, the pale and the dark, the latter is to be preferred, as it contains a larger proportion of mimotannic acid and catechin, upon the presence of which its astringent property depends. The dark kind averages 109 of tannin (mimotannic acid and catechin), the pale 97, in 200 parts. It is one of the most powerful and certain of the vegetable astringents, and may be advantageously combined with carminatives and chalk mixture. Alkaline salts are said to destroy its astringency.

Dose:—Of powdered Catechu, gr. x.-xxx. *Of the Compound Powder*, gr. xx.-xl. *Of the Lozenges*, 1 to 6. Each lozenge contains gr. j. of Catechu.

[1] Lancet, Sept. 19, 1868.

[2] Dublin Quarterly Journ. Aug. 1869.

676. *Therapeutic Uses. In Diarrhœa depending upon a relaxed state of the mucous membranes of the intestinal canal*, catechu, in doses gr. x.–xv. of the compound powder, or ʒj.–ʒij. of the infusion, may be given with great benefit. It is best exhibited in combination with opium and chalk mixture. It is useless in diarrhœa due to inflammation or liver derangement. *In the Diarrhœa of Children*, after acute symptoms have been subdued, or in any case where a considerable degree of looseness of the bowels persists after two or three days, one of the following mixtures of Dr. West (p. 604) may be used with advantage :—℞ T. Catechu ʒij., Ext. Hæmatoxyli ʒj., Syr. ʒj., Aq. Carui ʒix. M.; or ℞ Pulv. Cretæ Co. cum Opio gr. xx., Infus. Catechu Co. ʒjss. M. Dose of either ʒj., twice or thrice daily, for a child æt. one year.

677. *To Sore and Chapped Nipples*, the tincture is a good local application. The nipple is to be washed in warm water, then dried, and the tincture applied with a camel-hair pencil.

678. *In Ptyalism*, and in *Ulceration and Sponginess of the Gums*, and in *Relaxation of the Uvula*, a piece of catechu, allowed slowly to dissolve in the mouth, is often of great service. The infusion forms one of the best gargles in *Aphthæ of advanced Phthisis and other chronic diseases.*

679. *In Hypertrophy of the Tonsils*, a very serviceable astringent gargle is composed of Infusion of Catechu ʒvj., Tincture of Kino ʒij. M.

680. *In Leucorrhœa*, the Infusion of Catechu, used as a vaginal injection once or twice daily, has been found useful in lessening the quantity of the discharge.

Cera. See Vaseline.

681. Cerevisiæ Fermentum. Beer Yeast.

Med. Prop. and Action. Stimulant and antiseptic in doses of ʒss.-j. It is chiefly used externally in the form of poultice, prepared by mixing yeast (ʒvj.) with water at 100° (ʒvj.), stirring in wheaten flour ʒxiv., and placing the mass near the fire till it rises.

682. *Therapeutic Uses. To Fetid, Sloughing, Gangrenous*, and *Cancerous Ulcers*, the yeast poultice is a valuable application. It tends to destroy the fetor, arrests the sloughing, assists in the separation of the dead parts, and establishes a healthy granulating surface. Its efficacy is increased by the addition of charcoal. It occasionally produces great pain.

683. Yeast has been recommended in *Typhus*, *Typhoid*, and *Malignant Scarlet Fever;* also in *Dysentery*, *Diabetes*, &c. ; but in each its utility is very problematical.

684. *In Furunculosis*, a tablespoonful of yeast taken three times a day in milk is sometimes useful.

685. Cerii Oxalas. Oxalate of Cerium.

Med. Prop. and Action. Sedative and tonic. This and the salts of cerium were introduced by Sir J. Y. Simpson, as efficient substitutes for bismuth, nitrate

of silver, and hydrocyanic acid, to all of which they approximate nearly in their action on the system. The nitrate and oxide of cerium have been also employed in medicine, but the oxalate has been found most generally useful.

Dose:—The officinal dose, gr. i.-ij., is pronounced by Dr. Image (*infra*) as wholly inoperative, and he raises it to gr. x., which in severe cases he repeated every four hours, not only without any ill-effect but with advantage. From 5 to 10 grains may be taken as a medium dose for an adult.

686. *Therapeutic Uses. In Irritable Dyspepsia,* attended with *Gastrodynia, Pyrosis,* and *Chronic Vomiting,* it has been used with excellent results by Simpson and others. *In the Vomiting of Pregnancy,* it proved successful in the hands of Dr. C. Lee,[1] Dr. Waring-Curran,[2] and Dr. Image.[3] The last-named, who speaks highly of its efficacy, gave it thus:—℞ Cerii Oxalat. P. Trag. Co. āā gr. x., T. Aurant. ʒss., Aq. ad fʒj. M. To be taken half an hour before rising in the morning, and repeated three or four times a day if necessary. He also found it most efficacious in *Nausea resulting from Uterine Irritation,* but here he generally combined it with bromide of potassium.

687. *In the Cough of Phthisis,* Dr. Cheesman,[4] of New York, used the oxalate with great advantage. He gave gr. v. at bedtime, or on waking in the morning, or both, the dose being increased, if necessary, to gr. x., or more, thrice daily. The best effects were obtained in the early stages of phthisis or in *Chronic Bronchitis. In Dyspnœa,* with an asthmatic element, he also found it afford more or less relief. It was best given by placing it as a dry powder on the tongue, on an empty stomach. Mr. Clark[5] also found violent *Morning Cough* relieved by five-grain doses of the oxalate taken half an hour before rising.

688. *In Epilepsy, Chorea, and other allied Convulsive Diseases* in which the nitrate of silver is generally employed, it deserves a trial; for, as Simpson remarks, it is certainly attended with this advantage, that at the same time that it acts as a tonic and sedative, its use may be persevered in without any fear of discoloration of the skin. Dr. Ramskill[6] records two cases of epilepsy, preceded by a "gastric aura," benefited by the oxalate when belladonna and the bromides had failed.

689. CETACEUM. Spermaceti.

Med. Prop. and Action. Demulcent and emollient. Its chief use is as an ingredient in Ung. Cetacei, a soothing application for blistered or abraded surfaces. Dr. West (p. 407) furnishes the following formula for its internal administration:—℞ Cetacei Pulv. Tragacanth. āā ʒj., Syr. Papav. ʒj., Aq. Dest. ʒxj. M. ft. haust. This he found relieve the soreness *of the mouth and the dry burning sensation of the throat in Uterine Cancer,* besides being, he adds, a convenient vehicle for opiates when diarrhœa is present.

CHAMOMILE. See ANTHEMIS NOBILIS.

CHAULMOOGRA. See GYNOCARDIÆ OLEUM.

[1] Amer. Journ. Med. Sci. Oct. 1860.
[2] Med. Press, July 14, 1869.
[3] Practitioner, June 1878.
[4] Med. Times, July 3, 1880.
[5] Practitioner, April 1878.
[6] Med. Times, Jan. 1862.

690. Chloral. A dense, oily, colourless, pungent-smelling liquid, obtained by the action of dry chlorine gas on anhydrous alcohol. Mixed with water it becomes the Hydrate of Chloral, and then exists in the form of a white solid substance, with a pungent peculiar odour resembling that of a ripe lemon. It is in the latter form only, that of the hydrate, that it is employed in medicine.

Med. Prop. and Action. Hypnotic and anæsthetic. It was first brought to notice in these characters by Dr. Liebreich, of Berlin, and its claims have been carefully examined by Dr. B. W. Richardson,[1] who draws, amongst others, the following conclusions:—1. Deep and prolonged narcotism can be safely produced by the hydrate of chloral. 2. During a portion of the period of narcotism there may be complete anæsthesia, with absence of reflex actions, and a condition in which every kind of operation fails to call forth consciousness. 3. During the narcotism there are intervals of apparent exalted sensibility. 4. During the narcotism there is invariably reduction of temperature. 5. The hydrate produces muscular relaxation, which extends to the muscles of volition, and alike to the iris and the muscular arterial system. From the condition of the muscles after death, we may infer that this paralysis is, in part, due to change within the muscular structure itself. 6. The action on the nervous system is primarily on the sympathetic ganglia, afterwards on the cerebrum, and finally on the heart. 7. No bad results follow upon recovery. 8. In fatal cases, the functions destroyed are—(*a*) the cerebral; (*b*) the voluntary muscular; (*c*) the respiratory; (*d*) the heart. 9. In small proportions it arrests, in some degree, the coagulation of the blood, and in large quantities, stops the process of coagulation altogether. In large quantities, it also destroys the blood corpuscles, and produces general destruction of blood, but the dose required to produce extreme narcotism need not be so large as to lead to serious derangement of the blood. The great practical fact with regard to the hydrate of chloral is, that by its agency, administered internally in proper doses, we can induce a state of stupor or sleep which may be made to extend over five or even seven hours with comparative safety; and that in this state there is an interval of perfect insensibility to pain; but the interval is short, and for the greater part of the period the sensibility is either natural or exalted. In the case of every animal, from the lowest to the highest, observes Dr. Richardson, the sleep is induced, not merely without pain, but with an expression of pleasure; the sleep is gentle, seems to be attended with no symptom of distress, and leaves no serious evil behind. Some persons cannot take chloral on account of its pungency; in these, it causes heat in the throat and œsophagus, nausea, or in others restlessness, mental excitement, bad dreams, and so forth; but these cases are rare, and when they do occur the ill effects have happily been found very transitory. Although it may, as a rule, be considered a safe remedy, yet cases are recorded in which sudden death has taken place whilst chloral was being administered, and in some of these there appeared to be some connection between the drug and the fatal event; but though this has never been clearly traced, it indicates the necessity of caution in the use of this valuable remedy. It is apt to be employed too recklessly. Its powers as an hypnotic are greatly increased by combination with bromide of potassium. Its value as an adjunct to chloroform and to opium has been pointed out by Mr. Lawson Tait[2] and others. It intensifies the powers of iodide of potassium (*q.v.*). Its pungent taste is an objection to some. The generally received theory of its *modus operandi* is, that the hydrate of chloral, taken into the stomach, is rapidly absorbed, and coming into contact with the alkaline constituents of the blood, is decomposed into chloroform and formic acid, and that it is to the former, thus generated in the system, its effects on the organism

[1] Med. Times and Gaz. Oct. 30 and Nov. 6, 1869.

[2] Lancet, March 12, 1870; and Med. Times, Dec. 18, 1869.

are due. This view, however, has been disputed; and Dr. Wood (p. 346) considers that the evidence which has been adduced completely disproves the chloroform theory, and proves that chloral acts directly upon the organism. The point is still *sub judice*.

Dose:—For adults gr. xv.–xx.–xxx., repeated if necessary at intervals of two or three hours. *For Children* (who generally bear it well) gr. v.–vij. It should be given freely diluted (gr. x., Aq. ʒj.) with T. Aurant. or Aq. Spt. Menth. Pip. To disguise its taste, syrup is the best vehicle, especially when the object is to procure a night's rest; given in a thinner vehicle—*e.g.*, water—its effects are more rapid and of shorter duration. When given in the form of enema, the doses may be half as large again as those mentioned above. Suppositories may contain one part of chloral to five or even three of cocoa butter. The strength suitable for hypodermic injection is about 1 to 10. (See CHOLERA, *infra.*) Externally it may be applied in the form of lotion (gr. v.–xv. Aq. ʒj.), liniment (1 part in 30 of almond oil), or ointment (6 in 30 of lard). During the internal administration of chloral the use of alcoholic stimulants should be avoided.

In Poisoning by Chloral, strychnia, according to the experiments of Liebreich, acts as a speedy and complete antidote. The reverse does not hold good, because the action of strychnia is too rapid, fatal tetanus supervening before the chloral can be brought fairly into action. The question of antagonism between chloral and strychnia, calabar bean, and picrotoxine respectively, is examined by Dr. Milner Fothergill in his work on the "Antagonism of Therapeutic Agents" (London, 1878), which is full of interest. The nitrite of amyl (*q.v.*) is worthy of further trials in chloral poisoning. *See also Section* 713.

691. *Therapeutic Uses. In Midwifery*, chloral holds an important place; it cannot, indeed, compete with chloroform in relieving pain, but it produces a drowsy state in which the pain is not felt nearly so, acutely as before. It is in the first stage of labour, whilst the pains are cutting and grinding, and during the dilatation of the os, that it proves most useful. It is especially valuable when the pains produce intolerable suffering with but little effect on the progress of the labour, the os remaining thin and rigid. Under the influence of chloral, however, the pain becomes less frequent but stronger, nervous excitement is calmed, and the dilatation of the cervix proceeds rapidly. Dr. Playfair, whose words we are following (i. p. 344), states that he knows of nothing which answers so well in cases of *rigid, undilatable cervix* as chloral, and he believes it to be far more effective than any of the remedies usually employed. For this purpose he prescribes gr. xv. every 20 minutes until three doses are given. Under this the patient becomes very drowsy, dozes between the pains, and wakes up as each contraction commences. It may be necessary to give a fourth dose at a longer interval, say an hour after the third dose, to prolong the soporific action, but this is seldom necessary. Another advantage is, that while it does not interfere with chloroform (*q.v.*), in the second stage it renders it necessary to give less than would otherwise be called for, and thus its action can more easily be kept within bounds. Dr. Playfair's estimate of chloral as an obstetric agent is very high, especially in cases of *Rigidity of the Os and Cervix Uteri*. He has seen no bad effects follow its use when thus employed.

692. *Diseases of the Nervous System. In Insanity*, chloral holds a high place as a sedative and narcotic. Dr. J. H. Tuke,[1] after extensive experience of its use in insanity, concludes that chloral possesses the following advantages over the hypnotics generally employed:—(1) It is more uniformly certain in its action; (2) It has no depressing influence; (3) It does not cause constipation; (4) It does not produce nausea; and (5) Its effects are more lasting. *In the Insomnia of Insanity*, Dr. J. Barclay[2] agrees with Dr. Campbell in regarding chloral as superior to henbane, the bromide of potassium, or even morphine, as an hypnotic. *In Puerperal Mania*, Dr. Playfair (ii. p. 299) considers that there is no drug so valuable as chloral, either alone, or with bromide of potassium. A full dose (gr. xv.–xxx.) at bedtime, he says, rarely fails in procuring some sleep, and in an early stage of acute mania this may be followed by the best effects. If necessary, it may be repeated every night during the acute stage. If the patient will not swallow, it may be given in enema.

693. *Delirium Tremens.* In chloral, according to Dr. G. W. Balfour,[3] we possess a remedy which in all cases, from the slightest to the most severe, acts rapidly, safely, and efficaciously. Unquestionably, he observes, deaths must occasionally occur under this as well as under other modes of treatment, but the number of them must decrease, because, from the rapidity with which a cure is brought about many dangerous risks—*e.g.*, maniacal excitement, suicidal mania, exhaustion from sleeplessness, &c.—are averted. The risks the patient actually runs are not now, as formerly, connected with the treatment, but with his previous state of health. Thus, if he have a fatty heart, or has been exhausted by debauchery, or if he be epileptic, he may die suddenly during the attack. But if he be otherwise healthy, he is sure of a safe and speedy convalescence. In some cases two 30-grain doses of the hydrate were given at an interval of an hour between each, in others a single 45-grain dose was found sufficient. The former mode seems preferable. Dr. Barclay and many others have testified to its great value.

694. *In Sleeplessness*, chloral, in appropriate cases, is of the highest value, but it is not effectual in all alike. The more purely nervous the wakefulness is, the more successful is the remedy. When from functional over-excitement of the brain, due to excessive mental strain, or from anxiety and the like, the patient cannot sleep, chloral is by far the most valuable hypnotic. On the other hand, when severe pain causes wakefulness, chloral is of little value, at least in doses which are regarded safe. Sometimes even in these cases sleep will come, but it will very often be restless and troubled with moaning, and other indications of suffering, and it may be that the patient on awakening will complain that he has suffered more whilst sleeping than when awake. In occasional *Sleeplessness during convalescence from acute disease*, it proves very

[1] Lancet, March 26, 1870.
[2] Lancet, Sept. 21, 1872.
[3] Lancet, Feb. 1, 1879.

efficacious (H. Wood, p. 346). *In the Sleeplessness of Typhoid Fever*, Sir W. Jenner[1] states that he has seen good effects from a combination of chloral and bromide of potassium, but he limits its use strictly to the earlier stages of the disease—*i.e.*, to the period anterior to signs of nervous prostration. As a general rule, it is best given shortly before the usual hour of retiring to rest. In the majority of cases its operation is evident within half an hour. Beyond a little extra drowsiness on the following morning, it causes no inconvenience even when long continued.

695. *In Chorea*, the value of chloral has been variously estimated. Anstie[2] expressed his "complete distrust" of it; whilst Dr. W. H. Day[3] considers that there can be no question whatever that it is a valuable remedy in those cases of chorea especially where vascular excitement is present and the pulse good. Its danger as a depressant is nothing, he adds, compared to the repose and the rest which it ensures to the nervous system, lessening as it does, in suitable doses, the extreme agitation of the limbs and the violence of the choreic movements. The dose must be so regulated as to produce some hours' quiet sleep. Dr. Goeltz and Anger[4] record a case of chorea successfully treated by chloral enemata, ʒj. twice daily.

696. *In the Convulsions of Childhood and Infancy*, chloral has been used with great advantage by Dr. Rayne[5] and others. Two cases of *Infantile Convulsions* cured by enemata of chloral (gr. iij. in Aq. ʒv.) are recorded by M. Polaillon.[6] Sleep and cessation of convulsions followed, and a repetition of the enema twenty-four hours later completed the cure.

697. *In Puerperal Convulsions*, chloral is a remedy of the greatest value, and has proved successful in the hands of Dr. Allan Mackay[7] and others. Dr. R. Barnes[8] advises that before proceeding to the use of the bromides, as soon as the patient can swallow, a dose of chloral (gr. xx.–xxx.) be given. This, like chloroform, he remarks, removes all emotional sources of irritation, and lessens the sensitiveness of the nervous centres to peripheral irritation. The sleep it produces is eminently beneficial. He adds that he entirely concurs in the praises which many practitioners have bestowed on this most precious remedy in *Eclampsia*. Where the patient cannot swallow, the chloral should be given in the form of enema. Dr. J. Barclay[9] relates an apparently hopeless case cured by this means: only two enemas, each containing ʒss. of the hydrate were used. Dr. Playfair (ii. p. 284), whose experience is decidedly in favour of chloral, advises its combination with the bromide of potassium, gr. xx. of the former and gr. xxx. of the latter, every four or six hours; or if necessary, it may be given in an enema. (See CHLOROFORM.)

698. *In Spasmodic Asthma*, Dr. C. T. Williams[10] speaks highly of the value of chloral. In twenty cases in which he used it, speedy

[1] Lancet, Nov. 15, 1880.
[2] Practitioner, June 1874.
[3] Med. Press, May 21, 1879.
[4] Edin. Med. Journ. Aug. 1875.
[5] Lancet, Aug. 26, 1876.
[6] Edin. Med. Journ. Aug. 1876.
[7] Brit. Med. Journ. June 21, 1873.
[8] Obstet. Journ. 1873, p. 267.
[9] Brit. Med. Journ. May 31, 1873.
[10] Lancet, Oct. 11, 1873.

relief was obtained in all: in two it was only temporary, in the other eighteen it was permanent. It was given in doses of gr. xv.–xx. in Aq. Menth. Pip. ℥j. every three or four hours if required. The effect in almost every instance was that the patients fell fast asleep after the first dose, and slept in a recumbent position for a few hours, which they had not been able to do for days and weeks. If on waking there was any tendency to recurrence of spasm, the dose was repeated. Dr. Ronayne[1] also bears testimony to its great value in these cases, but Dr. Barclay (*op. cit.*) regards it as of little use. Where the asthma is connected with fatty degeneration of the heart, or other extensive disease of that organ, it requires to be used with the greatest circumspection, if employed at all.

699. *In Hooping-cough*, chloral was tried by Dr. W. Rigden[2] in fifteen cases, of whom thirteen were more or less benefited, some of them very rapidly. To a child æt. six months, he prescribed the hydrate in doses of gr. iij. twice daily in Aq. ℥j. In older children the dose was proportionately increased. Drs. Murchison, Adams, and others have likewise used it successfully.

700. In a severe case of *Croup*, Dr. J. Barclay (*op. cit.*) obtained great relief and eventual recovery in a child aged fifteen months by a combination of chloral gr. ij. and Vin. Ipecac. ♏ij., every two, three, or four hours, according to the effect produced.

701. *In Diphtheria*, chloral, as a local antiseptic application, has been successfully employed by several Italian physicians, and in this country by Mr. Hughes Hemming, of Kimbolton. He uses the syrup of chloral (gr. xx. ad ℥j.), and directs that it should be employed every hour or two. It does not, as a rule, cause any pain, and the nurse can easily be taught to apply it. He observes that "whilst it rapidly gets rid of the fetor, it is beautiful to see the membrane loosen and come away, leaving a healthy surface underneath." (Dr. Morell Mackenzie, p. 165.) It is indicated under the same circumstances as morphine (*q.v.*).

702. For controlling the *Irritable Cough of Bronchitis and Phthisis*, Dr. Ronayne (*op. cit.*) speaks highly of the value of chloral: he considers that it not only lessens the severity and frequency of the cough, but that it also reduces the amount of expectoration in a remarkable degree. By its means he states that he has succeeded in arresting the *Diarrhœa of Phthisis*.

703. *In many forms of Irritable Stomach*, chloral may be used with benefit. It almost always calms that organ, and even holds somewhat in check the obstinate *Vomiting of Organic Disease*. (Dr. Ronayne.) It has likewise been found effectual in the *Vomiting of Pregnancy*.

704. To prevent *Sea-sickness* on a short voyage, and mitigate it on a long one, chloral is stated to be very effectual.[3]

705. *In Cholera*, Dr. A. R. Hall[4] reports favourably of the hypodermic injection of chloral in the collapse of cholera of India, and he cites in support of it the experience of Dr. Higginson, Civil

[1] Med. Press, Dec. 28, 1870.
[2] Practitioner, Sept. 1870.
[3] Brit. Med. Journ. Dec. 3, 1870.
[4] Practitioner, July 1875.

Surgeon of Kheri, in Oude, who lost only two out of nineteen cases in which he employed it. He lays great stress on the strength of the solution—viz., 1 part to 10 of water: he injected 10 grs. of the hydrate, dissolved in 100 minims of water, in four different places, under the skin of the arms, without any local or general inconvenience. He urges further trials with it.

706. *Albuminuria.* Mr. T. Wilson,[1] of Wallsend, calls attention "to the almost marvellous effect of chloral in causing albumen to disappear from the urine, and with it the presence of an existing œdema." No absolute conclusions can be drawn from one or two cases, but the facts, he adds, "are so strong, and the results of treatment so striking, that these must be my excuse for bringing them under the notice of the profession." It is to be hoped that its powers in albuminuria may be further tested.

707. *Spasmodic Diseases. In Tetanus,* chloral has been extensively employed, and though it has not unfrequently failed, there can be no doubt that it is a remedy of great value when properly administered. The principles which should guide us in its use have been lucidly set forth by Mr. C. Macnamara,[2] late of Calcutta. Of twenty cases, seventeen recovered under the following treatment: A dose of 40 grains of the hydrate (for an adult) was given at bedtime, and in severe cases, where the temperature rose to 101° or upwards, another dose of 30 grains was repeated at mid-day. So long as the temperature was under 101°, the one evening dose was found sufficient, however severe the tetanic fit might be; but if it rose above this, the mid-day dose was found necessary. From these doses, Mr. Macnamara considers we gain all the advantages that chloral can afford, by inducing some hours' sleep, and shortening the intervals between the paroxysms. Larger doses seem to act injuriously, as too prolonged sleep is apt to be followed by a tetanic fit of dangerous violence. Dietetic is almost as important as medical treatment: it should consist of 4 oz. of milk with one egg beaten up in it, morning, noon, and evening: if the pulse indicates great weakness, beef-tea and brandy may be substituted for the milk: as the patient improves, milk, eggs, and arrowroot is the diet best suited, and may be continued for twenty or twenty-five days. The object throughout should be to procure for the patient a sufficiency of sleep and food, so as to enable him to live through the disease, for according to Mr. Macnamara's experience, if the patient can only be got through the first ten days, his recovery is almost certain. By combination with other drugs, the efficacy of chloral in tetanus has been thought to be increased; thus, Dr. Boon, of St. Kitts,[3] proposes Indian hemp; Dr. Watson Paul,[4] atropine; and Dr. J. H. Salter,[5] and others, bromide of potassium. The enormous doses taken by Dr. Salter's patient merits attention—about 60 drachms of chloral and 80 drachms of the bromide in the course of twenty days, and the man recovered! A case of tetanus successfully treated by

[1] Brit. Med. Journ. Dec. 23, 1882.
[2] Practitioner, Nov. 1872.
[3] Lancet, Feb. 16, 1878, p. 230.
[4] Lancet, Feb. 16, 1878, p. 231.
[5] Practitioner, Feb. 1882.

the hypodermic injection of chloral (gr. v.) is also related by Dr. Salter,[1] but it seems doubtful if this has any advantage over the ordinary mode of administration.

708. *In Tetanus Neonatorum*, Dr. Widerhofer[2] mentions six cases successfully treated by chloral, in doses of gr. j.–ij. at the time of each onset of convulsions. If the child be unable to swallow, it (in doses of gr. ij.–iv.) may be given by the rectum.

709. *In the Nocturnal Enuresis of Childhood*, the value of chloral (gr. xv. at bedtime) is attested by Dr. W. Thompson,[3] and Dr. Bradbury.[4] The latter also found it useful in *Nocturnal Seminal Emissions*. It may be repeated every night till the *habit* is broken through. Dr. Vechietti[5] successfully treated five cases of *Incontinence of Urine* by an evening dose (gr. viiss.) of chloral in water, abstinence from drink being at the same time enjoined.

710. *In Gonorrhœa and Gleet*, injections of a one per cent. solution of chloral are said to have been used with benefit. (Hill and Cooper, p. 518.) Four cases thus treated, with fair results, are recorded by Dr. Pasqua.[6]

711. *In Toothache*, the power of a few grains of the solid hydrate inserted into the cavity of a carious tooth was first pointed out by Dr. D. Page.[7] Dr. Spörer[8] has thus successfully treated thirty-eight cases, and he also obtained good results in several cases of *Hemicrania arising from carious teeth*.

712. *To Ulcers and Wounds*, Dr. Craig pronounces a solution of the hydrate of chloral (gr. v.–xv. Aq. ℥j.) an excellent antiseptic and sedative dressing applied by means of lint and gutta-percha in the ordinary way. At first it causes smarting, but this only lasts a few minutes and is succeeded by a most soothing, agreeable sensation. The solution injected into the sacs of large abscesses was found to lessen the discharge and aid the healing process. He speaks of it also as an excellent application to *Burns, especially when attended by a fetid discharge;* and as a lotion in *Inflammatory Affections of the Eye*, to *Sore Nipples*, and to *Inflamed Mucous surfaces generally*, he used it with advantage. Under the continuous use of a lotion (gr. xv.–xx., Aq. ℥j.) applied by means of lint and gutta-percha, *Warts* become smaller, and gradually disappear. *In Eczema and allied affections*, Dr. Craig[9] regards an ointment of the hydrate (gr. xxx.–lx., Ung. ʒj.) one of the best of applications. *In Pruritus Vulva*, Dr. Gellé[10] successfully applied a solution of the hydrate (1 in 10) as a lotion.

713. *Chronic Chloral Poisoning.*—The habitual use of chloral is apt to engender in some persons serious constitutional effects. In one group these manifest themselves in the respiratory organs, and are characterized by dyspnœa, which may be slight and occasional or constant and alarming; indeed, in one case death from bronchial effusion was apparently due to its action. In the second group,

[1] Practitioner, Dec. 1876.
[2] Lancet, March 18, 1871.
[3] Lancet, Nov. 19, 1870.
[4] Brit. Med. Journ. April 8, 1871.
[5] Ibid. April 25, 1874.
[6] Glasgow Med. Journ. June 1880.
[7] Brit. Med. Journ. Sept. 2, 1871.
[8] Practitioner, May 1881.
[9] Edin. Med. Journ. Feb. 1876.
[10] Ibid. Aug. 1876.

eruptions of the skin are the chief manifestations of the toxæmia. In the mildest of these there is no distinct rash, only the occasional transient red blotches on the face and neck. But there is a very extraordinary tendency towards the appearance of a rash or discoloration at the slightest cause, so that drinking a glass of wine will produce an intense even livid erythematous redness of the face. In other instances there is marked erythema, commencing in the face, and extending downwards to the trunk, becoming more and more general, and showing a marked tendency to follow the nerve-trunks. In the third group, petechiæ, ecchymoses, ulcerations, and even high fever and other pyæmic symptoms, are said to have been produced by the continuous use of chloral; but Dr. H. Wood, from whose valuable "Therapeutics" (p. 352) this paragraph is abridged, considers it very doubtful whether the drug was the cause of the symptoms recorded by Drs. Crichton Browne, Monkton, and Kirn.

714. *As an Anæsthetic in Surgery* Dr. Oré, of Bordeaux, in 1873, proposed the intravenous injection of chloral, but from the dangers attending its use in this way, and from the fact that inhalation of chloroform or ether is both safer and easier of application, it has never come into general use, and has been well nigh if not quite abandoned. A case in which a metatarsal bone was removed from a child aged three and a half years, whilst under anæsthesia induced by the subcutaneous (not intravenous) injection of chloral is related by Mr. Nairne,[1] of Glasgow.

715. Chlorum. Chlorine. At ordinary temperature it is a pungent suffocating gas; but by a pressure of four atmospheres at 60°, it is converted into a yellow liquid. Sp. gr. 1·33.

Med. Prop. and Action. Powerful irritant of the bronchial mucous membrane, causing, when inhaled, a sense of suffocation, violent cough, and spasm of the glottis. Properly diluted, it has been used with alleged benefit in some pulmonary and hepatic affections. Its chief value, however, is as a deodorizer, disinfectant, and antiseptic. It acts either by removing hydrogen from organic compounds, or by promoting oxidation by withdrawing the hydrogen from the water. It is commonly used in the form of chloride of lime, which readily yields chlorine when treated with strong acids. Nevertheless, it has been distinctively proved that the value of chloride of lime, and even of free chlorine, has been greatly overrated. It is true that very small quantities of chlorine will deodorize, but a good deal is required for the destruction of organic life. The common practice of placing saucers with chloride of lime, even with the addition of acid, in bedrooms, closets, &c., is not only useless, but dangerous, as tending to induce a false security. The only true use of chlorine as a disinfectant is in the disinfection of houses, clothing, and bedding, after disease. For this purpose the rooms must be closed up, and the chlorine generated in such quantity as to prevent the possibility of human beings entering for many hours. The following was the plan used by M. Regnault after the siege of Paris:—1lb. of chloride of lime, sewn up loosely in a strong canvas bag, is immersed in a mixture of 1½ pints of common hydrochloric acid and 4½ pints of water. The room is then closed, the chimney being blocked up, and the articles exposed to the gas for 24 hours, after which the room is

[1] Brit. Med. Journ. June 21, 1875.

ventilated for 48 hours. Everything may then be considered safe. The action of chlorine on metal-work and coloured fabrics must of course be borne in mind.[1] It has been proposed as an antidote *in Poisoning by Sulphuretted Hydrogen* and *Hydrocyanic Acid.* For the purpose of inhalation the *Vapor Chlori*, B. Ph., is a convenient form. It is prepared by placing chlorinated lime (ʒij.) in a suitable apparatus, and moistening with water; the generated vapour (chlorine) is then inhaled.

716. *Therapeutic Uses. In Chronic Bronchitis, Phthisis, Gangrene of the Lungs*, and other *Diseases of the Chest*, chlorine inhalation was formerly much in vogue, and though doubtless of benefit in certain cases, it has been superseded by other more effectual remedies. The testimony of Mr. Wallace[2] in favour of chlorine vapour baths in *Chronic Hepatic Affections* was very strong, but the treatment has fallen into perhaps unmerited disuse. The patient had to remain in the bath at 150° for half an hour at a time.

717. *Skin Diseases.* At the American Hospital for Skin Diseases chlorinated oil, prepared by passing chlorine gas through olive oil, was found to be a most decided parasiticide in *Scabies* and other cutaneous affections, applied night and morning by a piece of cotton saturated with it.[3]

718. Chlori Liquor. Solution of Chlorine. Chlorine gas dissolved in water, and constituting 0·006 of the weight of the solution. Sp. gr. 1·003.

Med. Prop. and Action. The concentrated solution is an irritant poison, and caustic; slightly diluted, it is a powerful counter-irritant; when largely diluted, it is a tonic and stimulant. As a gargle or lotion, an average strength is 1 part of the solution to 8 of water. Salivation is said to have followed its prolonged use. Like the gas, it destroys vegetable colours, and is an excellent deodorizing agent. It should be kept in a well-stoppered green glass bottle in a cool dark place.

Dose:—ɱx.–ɱxx., freely diluted, or it may be inhaled, 10 to 40 drops added to hot water, through an ordinary inhaler.

719. *Therapeutic Uses. In Scarlatina*, the solution of chlorine was formerly held in repute as an internal remedy, but it has fallen into disuse. It forms an excellent gargle for the sore throat which accompanies this disease.

720. *As a preventive to the infection of Puerperal Fever*, Dr. Semelweiss, during an outbreak of puerperal fever at Vienna, required all persons recently engaged upon post-mortem examinations to wash their hands in a solution of chlorine before attending parturients, with the result that the outbreak was stopped.

721. *In Aphthæ, Stomatitis*, and *Cancrum Oris*, the solution of chlorine, incorporated with equal parts of honey, is an efficacious application. *In Ptyalism*, a weak solution of chlorine (1 Liq. Chlor. to 8 of water) proves very serviceable, correcting the fetor

[1] Lancet, Jan. 26, 1873.
[2] Lancet, 1831-2, vol. i. p. 859.
[3] Glasgow Med. Journ. Oct. 1882.

and slightly diminishing the discharge. *In Cynanche Maligna*, its internal use has been attended with benefit. A solution (℥j., Aq. ℥v.) is a serviceable gargle, not only in this affection, but in *Cynanche Tonsillaris*.

722. *To Cancerous and other Ulcers, with a fetid discharge*, a diluted solution (*ut supra*) is useful in correcting the offensive odour. The great value of chlorinated solutions to *Suppurating Wounds* has been clearly shown by Dr. Hervieux.[1] He advises the permanent application of a sponge steeped in the chlorinated solution, and under its use he states that severe suppurating wounds are soon changed into healthy sores. It is well worthy of a trial.

723. CHLOROFORMUM. Chloroform. Terchloride of Formyle. A limpid, colourless, volatile liquid, of an agreeable ethereal odour and sweet taste. Sp. gr. 1·49. Dissolves in alcohol and ether in all proportions, and slightly in water, communicating to it a sweetish taste.

Med. Prop. and Action. Inhaled in the form of vapour, anæsthetic; taken internally, sedative and antispasmodic. Taken in small medicinal doses (♏iij.–vj.), suspended in mucilage, it produces little sensible effect beyond a sensation of warmth in the stomach, together with the relief, in many instances, of iirrtability or spasm of that viscus, should such exist. It has been thought that narcosis could not be induced by the introduction of chloroform into the stomach, but this is disproved by the following experiment by Dr. Anstie (p. 359) on himself:—On an empty stomach he swallowed ♏xlv. of chloroform suspended in ℥jss. of mucilage. Great warmth of the epigastrium and a feeling of flushing all over the body succeeded almost at once; five minutes after taking the dose, the pulse was throbbing 100 per minute, and the heart beating with uncomfortable violence, and there was decided confusion of mind. Five minutes later he experienced much nausea, and the pulse became slower, but at this point he fell into a state of unconsciousness. On recovering his senses he found that it was 46 minutes from the time of commencing the experiment. For nearly two hours after this he remained in a state of great discomfort, shivering, nauseated, and with aching pains in the head and limbs, which sometimes assumed the sharpness of a twinge of neuralgia. It was some time also before he recovered the full use of his limbs. A case in which a drachm swallowed proved fatal to a child is recorded by Taylor.[2] The addition of a small proportion of alcohol renders the operation of chloroform far more certain and manageable; and for internal use, therefore, the officinal spirit of chloroform, otherwise Chloric Ether, is far preferable to chloroform *per se*. Externally applied, undiluted, it acts as a rubefacient; diluted, as an anodyne.

Dose:—For internal administration, Chloroform ♏iij.–x. *Of the Spirit* (*Chloric Ether*) ♏xx.–lx. *Of the Compound Tincture*, ♏xx.–lx. Glycerine is said to be one of the best vehicles for its administration. For external use only, *Liniment of Chloroform*. For doses suitable for anæsthetic purposes, see *infra*. "Gelatized Chloroform," prepared by incorporating 1 part of chloroform and 2 parts of white of egg, is a good form for external use.

Dr. W. Marshall[3] has shown that, as an anodyne, a combination of chloroform and opium is more prompt and certain in operation than either agent given singly—*e.g.*, ℞ Chloroformi ♏x.–xx., T. Camph. Co. f℥j.–f℥ij., vel Liq. Opii Sed. ♏x.–xx., Mucilag. ℥j. M. ft. haust.

[1] Brit. and For. Med. Chir. Rev. Jan. 1861.
[2] On Poisons, p. 740.
[3] Glasgow Med. Journ. May 1869.

From the researches of Dr. Waller[1] it appears that chloroform possesses great advantages over alcohol or water, as a solvent of alkaloids and other substances intended for external application, as these chloroformic solutions applied to the skin are quickly absorbed, and produce local and general results according to the substances employed, whereas alcoholic and aqueous solutions were found to be either not at all or very slowly absorbed.

724. *As an Anæsthetic*, chloroform was first introduced into practice by the late Sir J. Y. Simpson in 1847, and from that date to this, a period of thirty-eight years, it has held a foremost place in the ranks of anæsthetics, notwithstanding many adverse criticisms, the appearance of numerous rivals under influential auspices, and the occurrence of manifold fatal cases during its administration. The advantages and disadvantages of chloroform are thus ably summed up by Dr. J. W. Browne:[2]—*Advantages.*—In most cases its administration is agreeable to the patient; rapid in its action; complete insensibility obtains; the entire absence of excitement when the insensibility is complete; little laryngeal or bronchial irritation; the easy maintenance of anæsthetic influence. *Disadvantage* is the risk attending its administration. Death from chloroform inhalation may, and probably often does, result from gradual paralysis of the respiratory muscles induced by the action of the chloroform upon the respiratory centres. A second form of death from chloroform inhalation is cardiac syncope, the heart at one moment beating well, and the next moment ceasing to beat for ever. This cardiac syncope constitutes the disadvantage (it may be said *the* danger) of chloroform, because when the respiratory centres are affected we can watch the state of breathing, and hereby, following out certain rules, danger can be averted. But when death takes place from cardiac syncope, there is no warning, the transition between life and death being almost abrupt; so that, granting this cardiac syncope to be a serious disadvantage to the use of chloroform, we must take every precaution, before commencing the operation, to limit the risk, by placing the patient in the recumbent posture, and attending to other well-known rules.

725. Dr. A. Crombie[3] calls attention to the value of morphine, subcutaneously injected, as a means of intensifying and prolonging, and at the same time rendering chloroform inhalation more safe. By this means he considers that the danger of paralysis of the function of respiration is eliminated. Similar testimony is borne by Dr. A. S. Currie.[4] The value of the combination was first brought to notice by MM. Labbé and Guyon.[5]

726. The relative advantages of ether and chloroform were carefully investigated by the Committee on Chloroform appointed by the Medico-Chirurgical Society.[6] In their Report they state that ether is slow and uncertain in its action, though it is capable of producing the requisite insensibility, and is less dangerous in its operation than chloroform. In many respects its action is similar to that of dilute chloroform. The primary stimulating effect of ether on the heart's action is greater and of longer duration, and the subsequent depression of the heart's action is not so great as that produced, at the same degree of insensibility, by chloroform. On the whole, however, the Committee concur in the general opinion which formerly in Great Britain had been led to regard ether as an inconvenient anæsthetic. They find a mixture of ether and chloroform to be as effective as pure chloroform, and a safer agent when deep and prolonged anæsthesia is to be induced; though slow in its action, it is sufficiently rapid in its operation to be convenient for general use. They suggest for use a mixture composed of ether three parts, chloroform two parts, alcohol one part (by measure), on the grounds that ether and chloroform blend uniformly when combined with alcohol, and the constituents escape equably in vapour. See also ETHER.

727. Chloroform, when first inhaled, gives rise to exceedingly pleasant sensations, and a rapid flow of thoughts and images, resembling an agreeable dream,

[1] Practitioner, Dec. 1869.
[2] Dublin Med. Journ. May 1881.
[3] Practitioner, Dec. 1880.
[4] Lancet, June 24, 1882.
[5] Bull. Thérap. March 12, 1882.
[6] Lancet, July 9, 1864.

until, as the dose is increased, these become confused and incoherent. Dr. Snow has divided its operation into five degrees or stages.

The First Degree includes the slighter effects which are experienced by the patient, whilst he retains sufficient consciousness to appreciate his situation, and a knowledge of what is occurring around him.

The Second Degree is a dreaming or wandering state of mind, which is observed when the patient is silent, immediately preceding the loss of consciousness.

The Third Degree. In this there are no voluntary movements, articulate sounds, nor anything indicating the presence of ideas; but there may be involuntary muscular contractions or rigidity.

The Fourth Degree is a state of absolute relaxation of the voluntary muscles, in which no contraction can be excited in them. The breathing is sometimes stertorous in this stage.

The Fifth Degree is a state of impeded respiration observed previous to death in animals killed by chloroform.

These various degrees run gradually into each other, and cannot always be clearly distinguished; it is seldom necessary, however, to carry the narcotism beyond the third degree, even in the most severe operations. The pulse is generally somewhat accelerated during the inhalation. The urine of persons subjected to chloroform and ether inhalation has been found to contain almost invariably a certain amount of sugar. For some interesting remarks on this point consult Dr. Pavy (p. 148 *seq.*) and Dr. Anstie (p. 367).

728. *Observations on its Use. Preliminaries.* 1. Unless very feeble, the patient should fast for three hours before the inhalation.

2. Twenty minutes before the inhalation, a dose of brandy should be given in water—a teaspoonful to a child, one or two tablespoonfuls to an adult.

3. The patient should, whenever convenient, be wholly undressed, and, invariably, everything tight about the chest or neck should be removed. The epigastrium should be uncovered, so that the respirations may be as carefully watched as they ought to be.

4. The patient should be in the recumbent posture, and on his back, with the chest and neck well exposed. Whatever form of apparatus be used (a piece of lint, a handkerchief and Skinner's inhaler, are perhaps among the best), there is little or no risk with the first inhalations; and the patient may be instructed "to draw full breaths." So soon as any effect is manifest, you must be more cautious. Watch carefully the pulse, the respiratory movements, and the colour of the cheeks, lips, and eyes. If the patient struggle much, proceed with increased caution.

5. Artificial teeth, if any, should always be removed before chloroform anæsthesia; serious results have followed the neglect of this precaution.

729. *On the appearance of any signs of danger*—e.g., *failing pulse, lividity of face, irregular gasping respiration, or stertorous breathing*—the inhalation should at once be stopped, and the patient be allowed to breathe fresh air. When respiration is arrested, the tongue should be seized with the tongue forceps (which should always be within reach) and drawn forward. This method was introduced by Sir Joseph Lister, but it is now considered that more advantage is gained by drawing forward the inferior maxilla; by so doing the muscles which connect the lower jaw with the larynx and os hyoides are drawn upon and open the larynx more freely than by simply drawing forward the tongue. The old plan, still retained by some, is then to place the patient on his left side, but Nélaton suggests, as more effectual, inverting the patient so as to lower the head and determine a flow of blood to the brain. This recommendation has been largely adopted, but its advisability, indeed its safety, is strongly called in question by Dr. Eben. Watson,[1] who maintains, with much show of reason, that the best position for such patients, as for all in syncope, is the horizontal. If these measures are of no avail, artificial respiration by Sylvester's, Marshall Hall's, or Howard's method, should be at once resorted to, and

[1] Lancet, March 10, 1883.

persevered in for half an hour or so, not neglecting the accessory measures of applying a sponge, saturated with hot water, over the heart, as advised by Dr. M'Leod of Glasgow, and flipping the surface of the body with a wetted towel. Should the respiration be noisy, it is well to pass into the back of the throat a sponge mounted on forceps, and remove any mucus which may prove to be there. An enema containing ʒj. of brandy has been advised as a means of arousing the patient, but it is doubtless far inferior in power to the inhalation of nitrite of amyl (*q.v.*), or the intravenous injection of Liq. Ammoniæ (*q.v.*), both of which have been advised as agents of great promise.

The administrator ought always to have with him brandy, a small quantity of nitrite of amyl, a pair of tongue forceps, an enema syringe, and a large flexible catheter. It is advisable that the patient should be undressed, since it may be very desirable to have the surface accessible.

By "flipping with the towel," is meant twitching the corner of a damp towel in such a manner as to cause the sharpest pain possible. It is by far the most effectual method of awakening a chloroform patient, and should, in case of danger, be practised instantly, and at several parts at once. Its effect is to excite locally the capillary circulation, and indirectly to stimulate the respiratory muscles, and even the heart itself.[1]

730. *Cautions and Contra-indications.* 1. Do not be too anxious to obtain a rapid effect. 2. Be careful that a large proportion of atmospheric air be mixed with and inhaled at the same time as the chloroform. The proportion of chloroform to atmospheric air should not exceed 3½ per cent. For the purpose of insuring accuracy in the proportion, the chloroform may be given by an inhaler—*e.g.*, Junker's, Snow's, Clover's, or Sansom's. 3. It should be given with great caution when extensive disease of the lungs or heart exists. 4. It should never be given when the pulse is weak and intermitting. 5. It is contra-indicated in poisoned conditions of the blood, as uræmia; and in acute cases of alcoholism—*e.g.*, delirium tremens. (Sansom.) 6. It should not be given in cases of advanced organic disease. 7. It is not advisable to induce profound insensibility during pregnancy. 8. It should never be employed without the presence of a medical man.

731. *Mode of administering Chloroform.* A plan commonly adopted is that which was first recommended by Sir J. Y. Simpson. A clean white handkerchief is to be folded funnel-shaped; into this the liquid is to be poured; it should at first be placed near the mouth of the patient; and after a few respirations, over the mouth and nose. It is a good plan to allow the patient to hold the handkerchief, unless we desire to produce a deep state of narcotism, as it will fall from the hand when sleep commences. Another mode of administration, proposed by Dr. Moir[2] and approved by Sir J. Y. Simpson, is to lay one single layer of a towel or handkerchief over the patient's nose and mouth, taking care not to cover the eyes, and to drop on this layer chloroform, drop by drop, until anæsthesia is sufficiently marked. This method has recently been warmly advocated by Dr. Martin Coates of Salisbury, who believes very small doses (♏ xx.–lxv.) are sufficient for even prolonged operations.

It may be doubted, however, whether, when complete anæsthesia is to be produced, these "simple" modes of administration are sufficiently safe for adoption. Dr. Snow proved that patients cannot breathe an atmosphere containing more than 5 per cent. of chloroform without danger. He objected strongly to the use of the handkerchief, and the Committee of the Royal Medical and Chirurgical Society[3] state that 3½ per cent. should be the average amount, and 4½ per cent. the maximum proportion. It is true that the above-named committee state that an apparatus is not essential to safety, if due care be taken in giving the chloroform. Free admission of air with the anæsthetic is the one thing necessary, and guaranteeing this, any apparatus may be used. On the other hand, it must be remembered that Sir Joseph Lister strongly supports the open method, and it is very largely employed in Scotland; nor is it believed are fatal cases more common there than in England.

[1] Brit. Med. Journ. Jan. 1, 1870.
[2] Edin. Med. Journ. Dec. 1861.
[3] Lancet, July 9, 1864.

732. *Directions for its employment.* The following are the rules for the use of chloroform in surgical operations, laid down by the Committee of the Royal Medical and Chirurgical Society:—

With heart disease the anæsthetic may be given in any case which requires an operation, although when there is evidence of a fatty, weak, or dilated heart, great caution is demanded. Valvular disease is of less importance.

In phthisis, when an operation is unavoidable, the anæsthetic may be given with impunity.

For all operations upon the jaws and teeth, the lips, cheeks, and tongue, the anæsthetic may be inhaled with ordinary safety. By care and good management the patient may be kept under its influence to the completion of the operation. In these cases, blood, as it escapes, if not voided by the mouth, passes into the pharynx. If any small quantity find its way through the larynx, it is readily expelled by coughing. In operations upon the soft palate, fauces, pharynx, and posterior nares, if sudden or severe hæmorrhage is likely to occur, it is not advisable to induce deep insensibility.

In cases requiring laryngotomy and tracheotomy, the anæsthetic may be employed with safety and advantage.

For operations upon the eye, involving the contents of the globe, the use of anæsthetics is open to objection on account of the damage which the eye may sustain from muscular straining or vomiting. If employed, profound insensibility should be induced.

In operations for hernia, and in the application of the taxis, the anæsthetic acts most beneficially. For most operations about the anus profound anæsthesia is positively demanded.

In the condition of shock or great depression, as after hæmorrhage, careful administration of the anæsthetic diminishes the risk of an operation.

In all cases other than those specially referred to, it is sufficient to state, so far as a mere surgical operation is concerned, that an anæsthetic may invariably be administered.

The continuous vomiting occasionally induced by and following upon the inhalation of anæsthetics, may be injurious by consequent exhaustion, as well as by mechanically disturbing the repair of a wound. With this reservation, they do not appear to interfere with the recovery of patients from surgical operations.

733. *In Midwifery* the power and value of chloroform inhalation is universally recognized, but it is neither used so recklessly in all stages of labour nor carried to the same extent as it was formerly; for experience has shown that, given in the earlier stages, especially if carried to the extent of producing more or less complete anæsthesia, it materially interferes with the uterine contractions; and that whilst it unquestionably annuls suffering it very frequently tends in a marked degree to diminish the force and frequency of the pains, and consequent retardation of the labour. Indeed, this very property of annulling uterine action is one of its most valuable qualities, as in certain cases of turning; but here it is necessary to give it to the surgical extent which should be avoided when used simply to lessen the suffering of ordinary labour. For this last-named purpose Dr. Playfair (from whose valuable work on Midwifery these remarks are cited) advises the use of chloral (*q.v.*), and he reserves chloroform until the os is fully dilated, the head descending, and the pains propulsive. There is one cardinal rule to be remembered in giving chloroform during the propulsive stage, he remarks, and that is, to administer it intermittently and never continuously. When the pain comes on, a few drops may be scattered over a Skinner's inhaler, which affords one of the best ways of administering it in labour, or placed within the folds of a handkerchief folded cornerwise. During the acme of the pain the patient inhales it freely to her great relief, and as soon as the pain dies away the inhaler should be removed. In the interval between the pains the effect of the drug passes off, so that the higher degrees of anæsthesia should never be produced. Indeed, when properly given consciousness should not be entirely abolished, and the patient between the pains should be able to speak and understand. This

intermittent administration constitutes the peculiar safety of chloroform in labour; as yet there is no case on record of death during the inhalation of chloroform for obstetrical purposes, and this is obviously due to the effect of each inhalation passing off before a fresh one is administered.

The effect on the pains should be carefully watched. If they become materially lessened in force and frequency, it may be necessary to stop the inhalation for a short time when the pains get stronger, which effect may be often completely prevented by mixing the chloroform with about one-third of absolute alcohol, as recommended by Dr. Sansom; this increases the stimulating effects of the chloroform and diminishes its tendency to produce undue relaxation. The amount administered must vary of course with the peculiarities of each case and the effect produced, but it need never be large. As the head distends the perinæum, and the pains get very strong and forcing, it may be given more freely, and it may often be pushed to complete insensibility just before the child is born.

In cases of operative midwifery it is often given to the extent of complete anæsthesia. In all such cases it should be administered, when possible, by another medical man, and not by the operator, because the giving of chloroform to the surgical degree requires undivided attention, and no one can do this and operate at the same time. The partial unconsciousness of incomplete anæsthesia, in which the patient is restless and tossing about, renders the application of the forceps, as well as all other operations, very difficult. Therefore, unless the patient can be completely and fully anæsthetized, it is better to operate without chloroform being given at all.

Bearing in mind the tendency of chloroform to produce uterine relaxation, more than ordinary precautions should always be taken against post-partum hæmorrhage in all cases in which it has been freely administered. (Playfair.)

Rigidity of the os and cervix uteri in labours yields more or less speedily to chloroform anæsthesia, but this may be accomplished equally well and with far greater safety by chloral (*q.v.*), for it can hardly be doubted, as Dr. Playfair observes, that chloroform predisposes to subsequent post-partum hæmorrhage.

734. *Therapeutic Uses. Spasmodic and Nervous Affections. In Spasmodic Asthma*, chloroform inhalation short of anæsthesia is often of value. With regard to its use in this class of cases, Dr. Hyde Salter draws the following conclusions:—1. It holds a high place amongst the remedies of asthma; there being probably no agent that relieves in so large a number of cases. 2. It operates with very various completeness in different cases. 3. Where it does not cure, it is of great value by affording a temporary respite. 4. No amount of asthmatic apnœa or dyspnœa is a bar to its use. 5. If given constantly, however, in large doses for a long period, a state of things arises which constitutes a bar to its continuance. 6. The sooner it is given in a paroxysm the better, for if the spasm has existed for some time, it is apt to recur as soon as the influence of the chloroform passes off. A few drops at the first indication of an attack, as was pointed out by Dr. Russell Reynolds, may act as a preventive. He mentions the case of a young lady who, by inhaling a few drops on her handkerchief whenever an attack threatened, at once averted it, and she was thus virtually cured. (Dr. Salter.) It should always be administered under medical supervision, and never by the patient himself.

735. *In Epilepsy*, chloroform inhalation has been employed both during a paroxysm and in the interval. Dr. George Johnson[1]

[1] Brit. Med. Journ. March 21, 1868.

speaks of its action in warding off a threatened fit, and in cutting short a violent and prolonged paroxysm, as uniform and certain. He considers that it probably acts in these cases by lessening the reflex excitability of the nervous system. Dr. Russell Reynolds (ii. p. 280), although admitting that it has delayed attacks while the patient is actually under its influence, remarks that it has failed to prevent their subsequent recurrence. This, however, is not in accordance with the experience of Dr. Brown-Séquard,[1] who speaks highly of its value in these cases, particularly when they partake of an hysterical character.

736. *In Chorea*, chloroform inhalation has been advised in order to control the convulsive movements; but Dr. Radcliffe (ii. p. 138) states that in three cases in which he tried it, it seemed to do more harm than good, and this he thinks is likely always to be the result, unless alcoholic stimulants are given in sufficient quantities before the inhalation, but when thus conjoined, benefit sometimes results. M. Gassier successfully employed chloroform frictions in three cases. He used a liniment composed of equal parts of chloroform and oil of almonds, which was well rubbed night and morning along the course of the spine. In none of the cases in which it was used does there appear to have been any organic disease of the nerves or nervous centres.

737. *In Hysteria*, chloroform anæsthesia is rarely required unless the paroxysms are very severe and prolonged; when they are so, and especially if attended with delirium, sleeplessness, &c., Dr. Brown-Séquard (*op. cit.*) speaks highly of its value. A few minims (xx.–xxx.) of the compound tincture with ammonia or assafœtida, given internally, often affords relief. Chloroform liniment locally applied often speedily relieves *Hysterical or Neuralgic Pain of the Side*. *In Hysterical Convulsions*, chloroform inhalation is very effective. (Dr. Graily Hewitt, p. 385.)

738. *In Puerperal Convulsions*, chloroform inhalation is frequently remarkably useful, and has the advantage of being equally applicable in all stages of the disease. Objections have been raised against it (as being likely to increase cerebral congestion, &c.); no one, however, who has used it, can doubt its great value in diminishing the force and frequency of the paroxysms. Its usefulness has been shown by Charpentier, who found that out of sixty-three cases in which it was used, in forty-eight it had the effect of diminishing or arresting the attacks, one only proving fatal. The mode of administration has varied: some have given it almost continuously, keeping the patient in a more or less profound state of anæsthesia. Others have given it only when there are indications of a recurring paroxysm. The latter is the plan adopted by Dr. Playfair (whose words we are quoting), and of its value in most cases he entertains no doubt. Occasionally cases occur in which chloroform inhalation is insufficient to control the paroxysm, or in which, from the cyanosed state of the patient, it seems contra-indicated. Moreover, it is advisable to have, if possible, some remedy

[1] Lancet, March 10, 1866.

more continuous in its action, and requiring less constant personal supervision; for this purpose Dr. Playfair (ii. p. 284) suggests chloral (*q.v.*). Dr. R. Barnes expresses himself strongly as to the value of chloroform in these cases. In young, robust plethoric women, one full bloodletting[1] may with advantage precede chloroformization.

739. *In Tetanus*, chloroformization has been largely employed. But the general result of experience is that while all the fatal symptoms disappear upon the inhalation of chloroform, they return at its removal with unabated violence, and the disease, unless arrested by other means, generally comes then to its fatal conclusion without delay.

740. *Infantile Convulsions* have been successfully treated with chloroform by Sir J. Y. Simpson and others, but it should only be resorted to where ordinary remedies have failed. "In cases," observes Dr. West (p. 193), "where depletion is inadmissible, where the convulsions are not obviously due to organic disease of the brain, while they are both severe in their character and are returning with frequency, the inhalation of chloroform sometimes altogether arrests them." He has also found it of temporary service in convulsions of a more chronic kind. It should only be administered under medical supervision.

741. *In Insanity*, chloroform inhalation has been used in some instances with benefit, but its applicability and safety as a general remedy have not been sufficiently proved. Where organic disease of the brain exists, it is at the best but a palliative. Its employment requires the greatest discrimination and caution. Van der Kolk (p. 157) states that in mania in hysterical patients he has seen quietude and sleep follow gutt. xv.–xx. taken internally in the evening, but he does not consider it suited for continuous administration, because the dose must be constantly increased.

742. *In Delirium Tremens*, the value of chloroform inhalation has been variously estimated, some writers speaking highly of the benefits to be derived from it, and others—the majority—agreeing in the main with the dictum of Dr. Wilks:[2] "You may quiet the patient by it for a time, but you do not in any way influence the disease." Dr. Anstie's (ii. p. 91) opinion of it is, on the whole, unfavourable; he mentions two cases in which the patient died

[1] With reference to venesection in puerperal convulsions, Dr. Playfair (ii. p. 282) offers the following sensible remarks: "In properly selected cases, judiciously employed venesection is a valuable aid in the treatment of eclampsia, and is likely to be specially useful in mitigating the first violence of the attack, and in giving time for other remedies to come into action. Care should, however, be taken in selecting proper cases, and it will be specially indicated when there is marked evidence of great cerebral congestion and vascular tension, such as a livid face, a full bounding pulse, and strong pulsation in the carotids. The general constitution may also serve as a guide; we shall be more disposed to resort to it if the patient be a strong healthy woman, and, on the other hand, to avoid it if she be weak and feeble. In any case, it must be looked upon as a temporary expedient, only useful in warding off immediate danger to the cerebral tissues, but never as the main agent in treatment. Nor can it be permissible to bleed in the heroic manner frequently recommended. A single bleeding, the amount regulated by the effect produced, is all that is likely to be of service.

[2] Med. Times and Gaz. Sept. 19, 1868.

suddenly from cardiac palsy while the inhalation was proceeding; and he thinks it undesirable that it should come into general use in delirium tremens, as it is certain that the evil effects of a narcotic depression of the heart's action are much more serious in this than in many other affections. Though less dangerous, he has no high opinion of chloroform administered internally: great benefit, however, is said to have been derived from the following formula of Dr. Goodfellow's:[1]—℞ Chloroformi ♏xx., Quiniæ Sulph. gr. ij., ℥. Card. Co. ʒj., Aq. f ʒx. M. ft. haust. 4tis vel 6tis horis sumend. If there be much febrile disturbance, calomel and opium āā gr. j. is prescribed.

743. *In Tic Douloureux and other Neuralgic Affections*, frictions with chloroform liniment are sometimes serviceable. Dr. Bartholow[2] of Cincinnati, has strongly advocated deep-seated injection of chloroform (♏xv.–xx.) carried down to the neighbourhood of the nerve-trunk, the peripheral distribution of which is the seat of pain. *In Sciatica*, a strip of flannel soaked in chloroform, placed along the course of the nerve and covered with oiled silk to prevent evaporation, proves sometimes extremely serviceable. (Dr. Fuller, p. 472.) *Nervous and Hysterical Headaches* often vanish under the internal administration of ♏xv.–xxx. of spirit of chloroform. *In Toothache*, relief often follows the introduction into a carious tooth of a piece of cotton wool soaked in a mixture of chloroform (2) and camphor (1).

744. *In Chronic Rheumatism, Lumbago, Myalgia, Painful Sprains*, &c., frictions with chloroform liniment often afford great relief. Better still is the application to the painful site of a piece of lint soaked in a mixture of chloroform and belladonna liniments, equal parts, covered with medicated wool and impermeable covering.

745. *In the Cough and Dyspnœa of Phthisis and of Bronchitis*, and also in *Pneumonia*, a few whiffs of chloroform (♏vj.–x.) are often signally useful, but the effect is only temporary. Dr. Ringer (p. 361) advises a mixture of chloroform and small doses of morphia, given with glycerine (ʒj.) in honey water, and for violent and paroxysmal coughs, and he directs it to be swallowed slowly, so as to be kept in contact with the fauces as long as possible. *In Hooping-cough*, benefit is often derived from similar inhalations, and also from frictions with chloroform liniment to the chest and neck. *In Laryngismus Stridulus*, chloroform inhalation was successful in the hands of Mr. Image,[3] and is advocated by Dr. Reid;[4] and with regard to its use in *Croup*, Dr. Eben. Watson[5] regards it as the most speedy and powerful relaxer of the glottis, and as such likely to be serviceable; but in this as well as in all this class of cases, it requires to be used with the greatest circumspection. *Obstinate and Spasmodic Hiccough* has been found to yield to chloroform inhalation.

[1] Brit. Med. Journ. July 3, 1869.
[2] Practitioner, July 1874.
[3] Ranking's Abstract, v. p. 380.
[4] On Infantile Laryngismus.
[5] Glasgow Med. Journ. Feb. 1867.

746. *In Angina Pectoris*, chloroform inhalations have been proposed for the relief of urgent symptoms, but from the alleged tendency of deep chloroform anæsthesia to paralyze the heart, it has rarely been resorted to. Ether inhalation seems preferable, as attended with less risk: if chloroform be given at all, it should be in doses short of complete anæsthesia. (Dr. Gairdner, "Syst." iv. p. 589.) Dr. G. W. Balfour,[1] however, expresses himself strongly in favour of the efficacy and safety of chloroform anæsthesia in these cases, the inhalation in each instance being preceded by the subcutaneous injection of morphia, which may account in a measure for the good results he obtained. Without this preliminary step the safety of chloroform anæsthesia in these cases is very problematical. These remarks apply with some modification to *Asthma*.

747. *In Obstinate Vomiting*, a few drops of chloroform given internally is often useful; even in that of *Yellow Fever* it has been found serviceable in preparing the stomach for the reception and retention of food, but as its effects are transitory, it requires to be repeated each time before food is taken.[2] It might probably be advantageously combined with Liq. Calcis (*q.v.*). *In Colica Pictonum*, M. Aran successfully employed chloroform; he not only gave it internally by mouth and *per rectum* in enemas, but also externally, compresses moistened with it, diluted, applied to the abdomen.

748. *In the passage of Gall-stones*, chloroform or ether, given either by the mouth, or better in the form of inhalation, has been found most efficacious; and they possess this advantage, that while they relieve pain, diminish spasm, and are rapid in their action, they do not interfere with that muscular contraction which probably assists in the onward propulsion of the stone. The same remark applies equally to the *passage of Renal Calculi*. There is reason to suppose that chloroform taken internally may exercise some influence as a solvent of biliary concretions, and hence may be regarded as a curative agent in gall-stones.

749. *In Cholera*, chloroform is a remedy of the greatest value, especially in the early stages. In doses of ℥v.–viij. every hour or half-hour, it often arrests the vomiting more speedily than anything else, and in the same doses tends materially to relieve the spasms and cramps; for the latter purpose the diligent use of chloroform liniment, either alone or conjoined with turpentine, is very effectual. If the vomiting be excessive, a little chloroform sprinkled on lint, placed over the epigastrium and covered with oiled silk or gutta-percha, often affords relief. The carbonated alkalies, soda or potash (gr. xl.–lx.) in solution, are said to aid the operation of chloroform when given internally; by some it has been found most useful when combined with oil of turpentine (℥xx.–xxx.). Being very volatile, it does not, like calomel or solid opium, accumulate in the stomach, and exert a deleterious influence when reaction sets in. Chloroform inhalation, stopping short of complete anæs-

[1] Edin. Med. Journ. March 1881.

[2] Reynolds' Syst. of Med. i. 675.

thesia, has been resorted to with the effect in most instances of relieving the spasms, but whether it exercises any influence on the duration or mortality of the disease, evidence is still wanting. Its operation requires the most careful watching. Dr. T. M. Lowndes,[1] of the Bombay Army, has for some years used the following formula :—℞ Chloroformi ℥xv.–xx., T. Opii ℥x.–xv., Spt. Vin. f℥j., Aq. ℥j. M.—in the treatment of *Choleraic Diarrhœa*, and with the best results.

750. *In Painful non-inflammatory Affections of the Uterus and Ovaries*, chloroform inhalation, short of complete anæsthesia, is often of great service. It is chiefly indicated in hysterical cases. Locally applied, a few drops on a piece of lint, placed over the uterine and ovarian regions, occasionally afford relief. (Dr. Graily Hewitt.) *In Dysmenorrhœa* it may likewise be employed with advantage. A flannel wrung out of hot water, and sprinkled with chloroform or chloroform liniment, will sometimes relieve the pain in *Dysmenorrhœa* : when this fails, or the pain is very severe, chloroform or ether inhalation may be resorted to : though its effects are but transitory, yet it sometimes exerts a permanent influence. Its application should not be entrusted to the patient or her friends. (West, p. 82.) *Inversions of the Uterus*, of months' or even years' standing, have been reduced under chloroform or ether anæsthesia. Several such cases are cited by Dr. Graily Hewitt.

751. *In Prurigo*, one of the most effectual applications is that advised by Dr. Neligan—viz., ℥xxx. of chloroform incorporated with ℥j. of cold cream. It will often afford relief when all other remedies fail. The above ointment has been found useful in *Eczema* and other skin diseases attended with much irritation, also in *Pruritus Ani*. *In Pruritus Pudendi*, Dr. Graily Hewitt found the greatest service from a mixture of chloroform and almond oil (1 part to 6) locally applied.

752. *In Irritable Ulcer of the Rectum*, the following ointment was highly spoken of by Mr. Curling : —℞ Chloroform. f℥j.–f℥ij., Zinci Oxid. ℥ss., Ol. Olivæ f℥j., Cerat. Cetacei ℥iv. M. ft. ung.

753. *In Intermittent Fever*, chloroform inhalation has been practised in America. It seems capable of alleviating the severity of the symptoms in bad cases, if not of curing the disease.

754. *Diseases of the Eye. Photophobia* is said to be speedily relieved by exposing the eye to the vapour of a few drops of chloroform. Chloroform or ether (anæthesia), observes Dr. Talfourd Jones[3] should be employed in all cases where, in consequence of photophobia and muscular spasm, a proper examination cannot otherwise be made. Chloroform acts readily on the pupil, causing at first contraction, and later on dilatation, by its paralyzing effect on the motor oculi. It is not only useful in enabling one carefully and easily to examine the eye, and apply local remedies that would sometimes have been impossible without it, but its sedative and

[1] Brit. Med. Journ, Aug. 29, 1868.
[2] Med. Times, May 9, 1868.
[3] Brit. Med. Journ. July 26, 1877.

anodyne action continues for some time, often many hours, after the general effect has passed away.

755. *In Strangulated Hernia* and in *Dislocations*, whether recent or of long standing, the value of chloroform is too well known to require further notice in this place, *In Spasmodic and Irritable Stricture of the Urethra*, the extreme irritability of the parts, and the sudden and persistent spasm which so often prevents the introduction of a bougie, are often speedily removed by chloroform, and the subsequent stages are rendered more manageable. Dr. Macleod,[1] of Glasgow, speaks of chloroform as of inestimable service in *Retention of Urine from Spasmodic Stricture of the Urethra.*

756. *In Paraphimosis* which has existed more than a few hours, time and suffering will be saved by putting the patient under chloroform before attempting reduction. (Hill and Cooper, p. 603.)

757. *Poisoning by Strychnia* has been successfully treated by chloroform inhalation. From experiments, Dr. Anstie draws the following conclusions:—1. Chloroform has no direct antidotal action to strychnia. 2. In large doses it may indirectly prolong life by inducing paralysis rather than convulsion. 3. In small stimulant doses, chloroform has the power temporarily of arresting the convulsions of strychnia, without inflicting damage on the vitality of the nerves; its action in this case is therefore *pro tanto* beneficial.

758. Chromic Acid. Acidum Chromicum.

Med. Prop. and Action. Powerful caustic; used in substances made into a paste with water, its action is exceedingly slow and gradual, but deeply penetrating. In saturated solution its action is less penetrating and less gradual. By using a solution more or less dilute, the action may be graduated according to the degree of effect desired. It is a powerful oxidizer, yielding its oxygen readily to organic matter, which is thereby dissolved. Smaller animals (mice, birds, &c.) were so completely dissolved by the acid in fifteen or twenty minutes that no trace of their bones, skin, hair, claws, or teeth could be discovered. (Heller.) It is not given internally.

759. *Therapeutic Uses. To Syphilitic Warts and Vegetations* it may on occasions be substituted for acetic or nitric acid (*q.v.*): it is more powerful than either, but causes severe pain. (Hill and Cooper, p. 590.) The strength of the solution used by Mr. Marshall,[2] who first recommended it in these cases, was 100 grains to 102 of distilled water. *For Warts on the hands*, chromic acid (1 to 1 of water) is, according to Dr. Allan Jamieson,[3] by far the best remedy. The skin round each wart should be first protected by painting with oil, and then the wart itself soaked with the chromic acid solution. Under its use these growths soon disappear. *In Secondary Syphilitic Affections of the Tongue, Tonsils, and Palate*, Mr. H. T. Butlin[4] has used, with marked success, a solution of chromic acid (gr. x. ad Aq. ℥j.) applied with a camel's-hair brush, three or four times a day: in a few cases gr. xv. ad Aq. ℥j. was ordered. Pain

[1] Glasgow Med. Journ. May 1872.
[2] Med. Times, 1859.
[3] Practitioner, Sept. 1881.
[4] Practitioner, March 1883.

or discomfort from the application was seldom complained of. *In Diseases of the Uterus*, Dr. Lombe Atthill[1] observes that chromic and nitric acids are nearly identical in their action, but the former he regards as more uncertain in its effects, and also more irritating. This applies equally to *Hæmorrhoidal Tumours*, for the removal of which it has been advised.

760. *In Cancerous and other Ulcerations*, in which a deeply penetrating gradual caustic is desired, chromic acid appears to be specially indicated. From its powerfully penetrating action, however, much care is necessary in its use, and it should in no case be laid over a surface to be cauterized in a layer deeper than a line in thickness. The surrounding parts require to be carefully protected by folds of lint or strips of plaster. Its tendency to penetrate too deeply is the great objection to its use.

761. Chrysophanic Acid, the active principle of Goa Powder (*q.v.*), constituting about 80 per cent. of that drug.

Med. Prop. and Uses. Chrysophanic acid was introduced in 1876 by Dr. Balmanno Squire as a sovereign remedy for *Psoriasis*. Others, notably Drs. Adams, Will, and Walter Smith, have confirmed his views, and shown that not in psoriasis alone, but in *Ringworm (of the body)*, *Tinea versicolor*, *Acne rosacea*, *and other Skin Diseases of a vegetable parasitic origin*, it is a powerful remedy. Dr. Squire (who has made it the subject of a monograph) used it of a strength of ʒij. to ʒj. of lard, but in the hands of others one-half or even one-quarter of this strength has been found to answer equally well. There are three objections to it:—(1) Its local irritant action produces within two or three days a dusky erythematous redness of the skin, partly the effects of the dye, partly the stimulant and irritant effect of the drug, followed in some cases by more or less inflammatory thickening of the skin, puffiness of the face, &c. (2) It stains the skin a yellow dusky colour, and where the hair of the scalp is white or light grey, it is apt to dye it a fine purple. All these effects, however, pass away, often in a few days, after the treatment is discontinued. (3) It stains the linen bed-clothes purple, which may, however, it is said, be removed by washing the articles in chlorine. Still, it must be admitted these are valid objections to its use, and patients naturally are averse to it, if a cure can be effected by some other more pleasant means. Dr. Napier[2] has tried it internally in *Psoriasis* with encouraging results—small doses, commencing with gr. ss., rubbed up with sugar of milk, after each meal; the dose to be gradually increased until signs of gastro-intestinal disturbance appear. In scruple doses it acts as a purgative and emetic.

762. *Therapeutic Uses.* Dr. Stocquart[3] gives it internally for *Psoriasis*, *Acne*, *Ecthyma*, *Impetigo*, *Pityriasis*, *Urticaria*, *Lichen*, *Prurigo*, *Eczema*. He gives it in gr. ss. doses either in water or pill. In some cases he used the hypodermic method, and found an effect more speedily produced.

763. Dr. Morrow[4] draws the following conclusions with regard to the therapeutic uses of chrysophanic acid:—(1) That it is perhaps the most efficient agent we possess for the external treatment of *Psoriasis*, especially chronic cases which have resisted other agents.

[1] Med. Press, Dec. 31, 1873.
[2] Glasgow Med. Journ. June 1882.
[3] Annales de Derm. et de Syph. Jan. 1884.
[4] Dublin Med. Journ. April 1883.

(2) That its range of application is limited: in children, in patients with sensitive irritable skins, and in acute cases generally, it is contra-indicated. (3) That in psoriasis affecting the face and hairy scalp, its intensely irritating action produces puffiness of the face and eyelids, and its discolouring effect upon the hair renders its employment impossible. (4) That it is prompt in its action, a week or ten days' active treatment being usually sufficient to develop its full therapeutic efficacy. (5) That its curative effect is only temporary: it does not afford a safeguard against relapses. (6) That it probably acts only locally, and by virtue of its irritating properties setting up a substitute inflammation, which modifies or corrects the tendency to the inflammatory growth of epidermic cells. (7) That its employment is attended with certain objectionable results, some of which always follow its use, whilst others depend upon idiosyncrasy. (8) That a brownish prune-juice discoloration of the skin, which persists long after the application is discontinued, a reddish staining of the hair and nails, and an indelible dyeing of the clothing, are inseparable from its use. (9) That the erythematous and furuncular inflammations which occasionally follow its use are incidental and do not depend upon an excessive strength of the preparation employed; they have been known to follow one of the strength of ten grains to the ounce. (10) That the strength of Dr. B. Squire's ointment (℥ij. ad Ung. ℥j.) is excessive: a milder strength (gr. xx.–lx. ad Ung. ℥j.) being usually sufficient to develop its full therapeutic powers. (11) That in other diseases in which it has been recommended, as *Acne*, *Favus*, *Pityriasis versicolor*, *Eczema marginatum*, &c., chrysophanic acid possesses no advantages over certain other drugs which are usually employed.

764. As mentioned above, chrysophanic acid is of great use as a local preparation in cases of *Psoriasis*, *Lichen planus*, and the various forms of *Parasitic Skin Disease*. In some cases,[1] severe diarrhœa, vomiting, hæmaturia, and tenesmus followed its use. Although it seems probable that pure chrysophanic acid was not used upon these occasions, yet the occurrence of such untoward symptoms must show the necessity for caution in prescribing this drug.

765. Cinchonæ Cortex. Cinchona Bark.

The pharmacology of this medicine has at the hands of Mr. Martindale received careful elaboration.[2] The officinal barks are:—Yellow Cinchona Bark (Cinchona Calisaya), Pale Cinchona Bark (C. Condaminea), *vars.* Chahuarguera and Crispa), Red Cinchona Bark (C. succirubra). The commercial barks are very numerous, and vary within wide limits in respect of the amount of alkaloids they produce. Although this question is one of vast importance to the practical physician, it is not within our power to enter into it more fully here. The Indian Pharmacopœia

[1] Glasgow Med. Journ. Oct. 1881.

[2] Extra Pharmacopœia, 1884, 3rd ed.

(p. 450 *et seqq.*) and the late Dr. Buchanan Baxter's researches (published in the "Practitioner") will furnish further details.

Med. Prop. and Action. All the varieties of cinchona are tonic astringent, and antiperiodic, and are, of all medicines of their class, the most powerful and uniform in their action. They owe their astringency to the presence of kinovic, cincho-tannic, and red cinchonic acids. Their tonic and antiperiodic properties are due to the alkaloids quinia, cinchonia, and cinchonidinia (*q.v.*). The active principles are not confined to the bark, but are contained in a minor degree in the leaves, the root-bark, and the young shoots. The leaves especially demand notice, for though not comparable to quinia as an antiperiodic, they apparently deserve to rank high in the list of astringent tonics, and like many other agents of this class, are quite capable of controlling *mild uncomplicated cases of malarious fevers.* This is probably due to the larger proportion of kinovic acid which they contain. They are well adapted for convalescence after fevers, and may be given in either of the following formulæ, advised by Dr. Chipperfield:[1]—℞ Cinchona Leaves, ʒjss., Acid. Sulph. ʒij., Cold Water ʒxx. M. Boil for ten minutes and strain. Or, ℞ Cinchona Leaves ʒj., Water ʒvj.; boil for ten minutes and strain. Dose, ʒiij.–ʒiv. thrice daily. Dr. Chipperfield observed no difference between the leaves of C. succirubra and C. condaminea, which were the kinds employed by him. Peculiarity in the action of the different kinds of bark depends on the proportion in which the alkaloids are present in them. From the large quantity which is required to be taken to obtain the full effect, and from the extremely nauseous taste, there are many persons who are unable to take cinchona without its causing derangement of the stomach, vomiting, headache, and in most cases constipation. These effects may, in a great measure, be obviated by administering its alkaloids, quinia or cinchonia; from both of which, as a rule, all the benefit (with the exception of the astringent effect) which is to be expected from cinchona may be obtained without its disadvantages. Occasionally, however, it happens that where the alkaloids fail to effect a cure, cinchona in substance is successful. In small doses, bark improves the appetite and the general tone of the muscular and circulating systems. It checks colliquative sweating in cases of extreme debility. Its action on the nervous system is shown by its extraordinary power in arresting diseases of a periodic character. In the treatment of *Intermittent Fevers*, it may either be given in a large dose shortly before the recurrence of the paroxysm, or in smaller repeated doses during the intervals. The efficacy of the infusion or decoction is greatly increased by the addition of a few drops of dilute sulphuric acid. (See also Quininæ Sulphas.) Externally applied, bark is an astringent and antiseptic. Finely powdered bark dusted thickly over *Foul, Indolent, Sloughing, and even Gangrenous Ulcers,* and left to form a kind of poultice, has apparently promoted the healing process. *Hospital Gangrene* has also been successfully treated in this way. In the same way it has been used to check the profuse discharge of *Eczema.* It acts in virtue of the tannin it contains. (Ringer, p. 586.) The infusion or decoction, with the addition of a mineral acid, forms a valuable gargle in *Ulcerated Sore Throat.* Powdered bark is useful as a dentifrice in spongy conditions of the gums.

Dose:—Of either of the Cinchona barks in powder, gr. xx.–lx. *Of the Decoction* ʒj.–ij. *Of the Infusion* ʒj.–ij. *Of the Tincture*, ʒss.–ij. *Of the Liquid Extract of Yellow Cinchona*, ♏x.–xxx. twice or thrice daily. *Of the Compound Tincture*, ʒss.–ij.

766. *Therapeutic Uses* are considered at length under Quininæ Sulphas (*q.v.*).

[1] Madras Quart. Med. Journ. 1866, vol. x. p. 85.

767. Cinchonia. Cinchonine. Cinchonidia. Cinchonidine. Quinidia. Quinidine.

Three alkaloids contained in varying proportions in the different kinds of Cinchona Barks. C. micrantha is peculiarly rich in cinchonia, specimens of Indian growth yielding upwards of 6 per cent. of it.

Prop. and Uses. Tonic and antiperiodic. Each of these alkaloids, with their respective sulphates and the hydrochlorate of cinchonia, have been proposed as substitutes for quinia, but they have not hitherto been employed to the extent which they appear to merit. In 1866 a commission was appointed at Madras to examine their real value, and supplies of them distributed to medical officers at "notoriously malarious stations," and were tested by them in 1,145 cases of paroxysmal fevers of all types; 410 by sulphate of cinchonia, 359 by sulphate of cinchonidia, and 376 by sulphate of quinidia. Of the 1,145 cases treated there were 4 deaths and 27 failures, the latter presenting a percentage of just over 2 per cent.—a satisfactory result. The following abridged quotations from the report will serve to place the subject in a clearer light. The doses and mode of administration vary a good deal. Some medical officers used large doses (gr. xv. to xx.), others medium doses (gr. viij. to x.), and some small doses (gr. ij. to v.) As a general rule, it appears that those experiments were most successful in which medium doses were administered in a single dose daily, the cases recovering more expeditiously than when larger or smaller quantities were employed. Large doses of either of these alkaloids produce effects very similar to those of quinine. Disagreeable noises in the head, singing in the ears, deafness, and giddiness, were the most noticeable symptoms. Vomiting, nausea, and purging were also occasionally noticed to follow their use. Small or moderate doses produced none of these effects, while they improved the appetite, strengthened the digestion, and in many cases appeared to have a marked effect in reducing the size of congested spleens. The evidence adduced does not show any particular superiority of one alkaloid over the other. The average dose of each is apparently about 10 grains. The sulphate of quinidine is perhaps the one regarding which there is the least difference of opinion as to its merits; all three are undoubtedly antiperiodic, and capable of controlling paroxysmal fevers. The sulphate of cinchonine in large doses perhaps causes more unpleasant symptoms than the others, but on this point further evidence is wanting. In some cases larger quantities were exhibited than were necessary to check the fever. "The main conclusion which the members of the commission have derived from the data before them is, that these alkaloids, hitherto little valued in medicine are scarcely if at all inferior as therapeutical agents to quinine."[1] For further confirmatory remarks on these alkaloids see Dr. J. Ewart (*Indian Ann. of Med. Sci.* xiii. (1869), p. 1; Dr. J. Cleghorn (*Ibid.* p. 326); Dr. J. B. Hamilton (*Indian Med. Gaz.* March 1, 1871); Surgeon-Major G. J. Hunter (*Lancet*, May 15, 1875); and Dr. Dougall (*Edin. Med. Journ.* Sept. 1873, p. 193).

Cinchona Alkaloids, Mixed. See Quinetum.

768. Cinnamomi Cortex. Cinnamon Bark.

Med. Prop. and Action. Aromatic stimulant, carminative and astringent; supposed to act specifically on the uterine muscular fibre.

[1] Pharm. of India, p. 453.

769. *Therapeutic Uses. In Flatulence, Colic, and Spasmodic Affections of the Bowels,* the compound tincture of Ph. L. (Cinnam. cont. ʒj.; Cardam. cont. ℥ss.; Piperis long. cont. ʒijss.; Zingib. cont. ʒijss.; Spirit. Vini. Oij.), in doses of fʒss. to fʒij., proves a grateful and efficient carminative.

770. *In Atonic Diarrhœa,* the powder, in combination with chalk and opium, is often given with marked advantage.

771. *In continued Nausea and Vomiting,* an aqueous infusion of cinnamon is often useful.

772. *In Uterine Hœmorrhage,* cinnamon has been employed, but with very doubtful advantage. *In Chronic Uterine Hyperœmia,* Dr. Meadows[1] states that he has seen good results from both borax and cinnamon, in cases where ergot disagreed, though he regards them as certainly inferior to the latter drug.

773. Citric Acid. Acidum Citricum.

Med. Prop. and Action. Refrigerant and antiscorbutic and febrifuge. This acid is rendered more grateful and refreshing by using water impregnated with carbonic acid gas instead of common water. The citrates of potash and ammonia are refrigerant and slightly diuretic; those of soda and magnesia, purgative. The following table shows the equivalents required for making effervescing draughts:—

grs.		grs.					
20 of Carb. of Soda	=	9¾	of Citric Acid,	or	ʒijss.	of Lemon-juice.	
„ Bicarb. of Soda	=	17	„	„	℥ss.	„	„
„ Carb. of Potash	=	17	„	„	℥ss.	„	„
„ „ of Ammon.	=	24	„	„	ʒvj.	„	„

774. *Therapeutic Uses. In Fevers,* it proves a useful and grateful refrigerant; it affords, in many instances, a great amount of relief; and in *Scurvy* it has been used with great advantage, although greatly inferior to lemon-juice. (See Citrus Limonum.)

775. Citrus Limonum. The Lemon Tree.

Citrus Bergamia. The Lime Tree.

Med. Prop. and Action. The juice of the fruits of these trees, known respectively as lemon-juice and lime-juice (*Limonis Succus*), is refrigerant and antiscorbutic. The outer part of the rind of the ripe fruit (*Limonis Cortex, Lemon Peel*) is an aromatic bitter, and forms an agreeable adjunct to other vegetable tonics, and the expressed or distilled oil from the rind (*Limonis Oleum*) is stimulant and carminative. That which is commonly sold as Essential Salts of Lemon is the binoxalate of potash, and does not exist in any of the Lime tribe; it is a misnomer, which might lead to serious mistakes. Lemon-juice contains citric acid and malic acid in combination with potash and mucilage. The average quantity of citric acid in a fluid ounce is 32·5 grains, and in this its antiscorbutic, as well as its refrigerant, properties are supposed mainly to reside. According to Dr. Owen Rees, lemon-juice in doses of ʒj. thrice daily, causes a marked depression of the heart's action, the pulse in one instance falling from 120 to 75, and in another from 110 to 74, and becoming at the same time weaker and more compressible; this effect was observed equally in persons suffering from acute rheumatism and in persons in health. *As an Antidote to Acro-Narcotic Poisons,* lime or lemon-juice is often very effectual. Its *modus operandi* is obscure, but its effects are often very remarkable. In over-

[1] Practitioner, May 1871.

doses of croton seeds (Croton Tiglium) I have witnessed almost immediate cessation of the vomiting, purging, and pain, from a single draught of lime-juice. It appears to be more or less useful in poisoning by all plants of *Nat. Ord.* Euphorbiaceæ.

776. *Therapeutic Uses. In Scurvy,* lime-juice is of value as a preventive and as a curative agent. Formerly, scurvy was believed to be due mainly to abstention from fresh vegetables, and it was sought to supply their place by lime-juice. The theory of Dr. Garrod, that scurvy was the expression in the system of a lack of potash salts, although highly ingenious, admits of no conclusive proof. The experience of Dr. William Neale, gained in the *Eira* expedition,[1] led him to believe that scurvy was due solely to want of hygienic precision, and could be obviated by the use of fresh meat *with its blood* and general hygiene, and that lime-juice was by no means necessary as a prophylactic. These views are not, however, accepted generally, and the experience of most naval surgeons is in favour of the antiscorbutic powers of lime-juice.

777. *In Acute Dysentery and Diarrhœa,* lime-juice has occasionally been found serviceable. It is only in *Scorbutic Dysentery,* however, that much benefit can be expected from it.

778. *In Acute Rheumatism,* lemon-juice in large doses (℥j.–ij. every four or six hours) has been advocated by Dr. Owen Rees and others, who recorded cases successfully treated with it. Dr. Fuller, after an ample trial, discarded this treatment as uncertain.

779. *In the Vomiting of Pregnancy,* lemon-juice proved very effectual in the hands of Dr. Dewees. It is also occasionally of service in *Heartburn.*

780. *In obstinate cases of Palmar Psoriasis,* few local remedies, according to Dr. Dyce Duckworth,[2] exceed lemon-juice in value. The part should be rubbed with a piece of freshly cut lemon, several times a day. It may be used in all chronic unyielding cases, whether of syphilitic origin or not.

781. *In Pruritus Scroti and Pruritus Ani,* lemon-juice is often an effectual remedy. The parts should be first bathed in hot water, and afterwards fresh lemon-juice freely applied. When the pain and smarting caused by the application subsides, great relief will be experienced.

782. *In Febrile and Inflammatory Diseases,* an agreeable refrigerant beverage is formed by macerating two sliced limes or lemons and ℥ij. of sugar in Oj. of boiling water. When cool, it should be strained and drunk *ad libitum.*

783. *In Diabetes,* water acidulated with lime or lemon-juice is preferable to plain water for allaying the great thirst. As a general rule, fluids in these cases, should not be drunk at meals, but in the intervals between them.

Cocaine. See Erythroxylon Coca.

Cod Liver Oil. See Oleum Morrhuæ.

[1] Trans. Roy. Med.-Chir. Soc. Feb. 1883.

[2] Lancet, July 4, 1874.

784. Codeina. Codeine. An alkaloid discovered in 1832 by Robiquet, in Opium, of which it constitues $\frac{1}{4}$ to nearly 1 per cent.

Med. Prop. and Action. Dr. Harley comes to the conclusion that its action on man closely agrees with that of morphine; like it, possessing hypnotic and excitant properties. In those who are susceptible of the hypnotic action of opium, it induces somnolency when given continuously in doses of gr. j.–ij. The effects, however, are much more transient than those of the other somniferous principles of opium. Its excitant properties are indicated by the stimulant action upon the heart and motor centres, resulting in acceleration of the pulse, contraction of the pupils, and derangement of the vagus. In cats, dogs, and rabbits it induces convulsions, but these have not been observed in man, even when the dose has been carried up to ten grains. From observations made by Dr. Harley, it appears that atropine given with codeine completely counteracts any nausea or other unpleasant effect of the latter. Excepting the effect on the pupil, all atropine symptoms are increased and prolonged by codeine. It is prescribed by the French Codex in the form of syrup, in doses varying from $\frac{1}{15}$ to $\frac{1}{6}$ gr. Dr. Harley considers that it possesses no advantage over morphine, but rather the contrary, and that it cannot be recommended as a useful or desirable addition to our materia medica. However, in *Diabetes*, Dr. Pavy[1] prefers codeine to opium and morphine, being equally effectual in controlling the disease without exerting the same narcotic effect. He considers gr. $\frac{1}{2}$ thrice daily a proper commencing dose, and this may be gradually increased to gr. ij.–iij. He considers that codeine proves a valuable agent in diabetes, exhibiting in some cases apparently a direct curative action. (See also Opium.) Dr. Aran also speaks highly of the relief obtained from it in *Bronchitic Coughs* and *Phthisis*, in *Rheumatism*, *Gout*, *Cancer*, &c.

785. *Therapeutic Uses.* In *Diabetes*, Dr. Pavy has shown that codeine is often useful, and his observations have been verified by experience. The cases in which codeine succeeds cannot be prejudged, nor can any cause be assigned for its failure in others.

786. *In Polyuria and Saccharuria*,[2] codeine has been found not only to lessen the sugar absolutely, but also to diminish the amount of urine. Its value in these diseases is fully established by the recorded experience of Dr. Lauder Brunton, Dr. Shingleton Smith, Dr. Cavafy, and others. When given in a small dose (gr. $\frac{1}{2}$) to begin with, and gradually increased, no other effect may be perceived beyond the gradual disappearance of sugar from the urine. (See also Opium.)

787. *In Cough* and *Nervous Restlessness*, especially when due to *Phthisis*, opium often upsets digestion, and so does more harm than good; it is in these cases that codeine may be beneficially employed. Dr. Saundby[3] has also used it with advantage in the *Cough of Phthisis*, and in other *Coughs occurring in Gouty subjects*, where opiates were inadmissible. He gave gr. j. doses dissolved in syrup of Tolu.

788. As an hypnotic and anodyne in *Muscular Spasm*, codeine seems to be of less service than morphine.

[1] Guy's Hosp. Rep. 1870, xv. p. 420. St. George's Hosp. Rep. ix. p. 679.

[3] Brit. Med. Journ. April 12, 1879.

789. Coffea Arabica. The Coffee Plant.

Med. Prop. and Action. The berry (*vulgo* Coffee), when dried and roasted, is a nervine stimulant, its activity residing in a crystalline principle, Caffeine, and in an empyreumatic oil which, as Dr. H. Wood observes (p. 211), has decided effects upon the system. Its existence has indeed been too much overlooked by medical writers, whose attention has mostly been directed to caffeine. This principle, as is now well known, is identical both chemically and physiologically with Theine, Cocaine and Guaranine, each of which in large doses produces paralysis of sensibility, tetanic spasms and convulsions. (Ringer, p. 585.) That coffee assists the digestive process, probably by stimulating the biliary secretion, appears certain; and in certain febrile diseases strong coffee is thought to be useful in arresting any excessive metamorphosis of tissue. Coffee, as Dr. Parkes observes, is a most important article of diet for soldiers, as not only is it invigorating without producing subsequent collapse, but the hot infusion is almost equally serviceable against both cold and heat: in the one case the warmth of the infusion, in the other the action of the skin, being useful; while in both cases the nervous stimulation is very desirable. "Caffeine is a very active substance," Dr. Farquharson remarks (p. 286), "causing at first increase, but later, diminution, of the reflex functions of the cord, with nervous convulsions and muscular rigidity, the motor nerves not being affected. The heart's action is first accelerated, but afterwards retarded. The excretion of urea is lessened." This statement with regard to urea is not in accord with the observations of Lehmann, Roux, and others cited by Dr. Wood (p. 216). That the citrate of caffeine possesses valuable diuretic properties has been shown by Drs. L. Shafter,[1] Leech,[2] and Brackenridge.[3] The last named considers that the diuretic action of caffeine is due for the most part to a power which it possesses of stimulating the renal glandular epithelium. Coffee is useful in disguising the taste of quinine, aloes, Epsom salts, and other disagreeable medicines.

790. *Therapeutic Uses. In Asthma,* coffee is a remedy of considerable value. According to Dr. Hyde Salter (p. 202), it relieves about two-thirds of the cases in which it is tried. Unless sufficiently strong to produce its characteristic physiological effects it does no good: if given very strong, it need not be given in much bulk. It is best given without sugar and milk—pure *café noir.* It should be given on an empty stomach: taken on a full stomach it will do more harm than good. It seems to act better if given hot —very hot. To these hints it may be added that asthmatic patients should avoid using coffee as an ordinary beverage, lest the habit of taking it should impair its efficacy as a remedial agent. It is a simple and safe remedy which should never be neglected.

791. *Strangulated Hernia.* According to Dr. Marchant,[4] coffee taken internally is capable of a remarkable influence in aiding or causing reduction. About half a pound of powdered roasted coffee is infused in twelve cupfuls of boiling water, and of this the dose is a cupful to be taken every quarter of an hour till six or eight cups have been taken, after which half an hour may elapse between each dose.

792. *In the Vomiting of Pregnancy,* Prof. Meigs advises a cup of hot coffee and a piece of dried toast to be taken very early in the morning; after which the patient should be quiet until her usual time of rising; by this means the vomiting may often be prevented. The addition of bromide of potassium often aids.

[1] Practitioner, Jan. 1879.
[2] Practitioner, July 1880, p. 25.
[3] Edin. Med. Journ. July 1881.
[4] Braithwaite's Retrosp. xxxvii. p. 199, lix. p. 228.

793. *In Tic Douloureux, Hemicrania, and other Neuralgic Head Affections* (*Migraine*), coffee is much employed by the Belgian physicians. M. Hannon advises the internal use of the citrate of caffeine, in doses of gr. j. every hour, for some time before the expected paroxysm. Dr. Anstie[1] mentions two cases of *Neuralgia*, one of them a case of *Dorso-intercostal Neuralgia attending Shingles*, in which caffeine (gr. j. in solution), introduced hypodermically, afforded great relief. He also states that in one instance he found it of great service in *Alcoholic Sleeplessness*. Thus used, he considers that it is likely to prove a valuable remedy in this class of affections.

794. *In Poisoning by Opium, Aconitine, and other Narcotic Poisons*, a strong infusion of coffee, without milk or sugar, is an effectual stimulant. It is also advantageously given in the *Depression after Drunkenness*.

795. Caffeina. Caffeine.

Med. Prop. and Action. A crystallized principle obtained from coffee seeds. It is identical with Theine, Guaranine. Soluble in water (1–100) and rectified spirit (1 in 25) and ether, but insoluble in absolute alcohol. It contains more nitrogen than any other alkaloid.[2] Caffeine has a bitter, disagreeable taste; it acts as a cardiac stimulant, and promotes arterial tension. It has, in large toxic doses, marked effects on the economy. Prof. Binz[3] believes caffeine raises the temperature, and kills by causing convulsions. These views are not in harmony with those of other observers. The physiological action of caffeine may be thus summarized.[4] Upon the nervous and muscular system caffeine acts as an excitant. It acts upon the vaso-motor centre, causing slowing of the heart, while it increases the force of the heart beat, but enhances arterial pressure. Peripheral temperature is lowered. Large doses paralyse the peripheral nerves of sensation and increase reflex excitability of the cord. The excitability of the vagus is lessened. The heart (in warm-blooded animals) quickens its rate and stops in diastole. The muscles are thrown into tetanus. The conclusions arrived at by the Committee of the Brit. Med. Ass. in 1874 are pretty well in accord with those of Dr. Leblond. They place caffeine in the same place with theine and guaranine. It may be given as a citrate, hydrobromate (gr. j.–v.) or valerianate (gr. ½ to 3). It forms double salts with salicylic and other acids. Martindale gives the following recipe for hypodermic injection solution:—Caffeine gr. xx., Salicylate of Sodium gr. xvii. ss., Dist. Water ʒj. Dose ɱj.–vj. Caffeine may also be conveniently given in compressed tablets.

796. *Therapeutic Uses. Cardiac Diseases.* Some state caffeine is superior to digitalis. It slows the heart and steadies it, while it increases the force of the beat. It possesses powerful diuretic properties, and hence is very serviceable in *Mitral Disease* associated with *Dropsy*. In doses of gr. iij. to v. it will usually be well borne even when digitalis cannot be given. Dr. Shafter[5] believes caffeine both drains the parenchymatous tissues, and stimulates the intra-cardiac ganglia.

797. *In Cardiac and Renal Dropsy*, caffeine is very valuable.

798. *In Intestinal Obstruction* and *Strangulated Hernia*, caffeine acts upon the muscular tissue, and so will often prove of the utmost value in these cases.

[1] Practitioner, July 1868.
[2] Extra Pharm. 63.
[3] Archiv f. Experim. Path. ix.
[4] La Trib. Méd. Dr. Leblond.
[5] Practitioner, 1879, p. 29.

799. *Atonic conditions of the Stomach.* Bartholow believes it lessens tissue change and waste. He finds it useful in *Phthisis.*

800. *Nervous Affections. In Neuralgia, Hemicrania,* caffeine is, according to Dr. Shafter, of signal value. [See §793.]

801. *Spasmodic Asthma and Hooping-cough.* Dr. Thorowgood strongly recommends citrate of caffeine in *Bronchial Spasm.*

802. *Nervous Vomiting of Hysteria.* Dr. Paret has used the valerianate, and has succeeded by its means in completely arresting the vomiting. He found it to fail, however, in the *Vomiting of Phthisis and of Pregnancy* with the valerianate.

803. *Hemicrania* is, according to Binz, relieved by caffeine. It is curious in this connection to note that in hemicrania, as the attacks often pass off, there is an accession in the amount of urine voided. Binz gives gr. ij., and increases this dose to ten times that amount.

804. *Brain Weariness and Nervous Exhaustion* are relieved by caffeine : gr. j. or more may be usefully administered in a cup of coffee. Its use is contra-indicated in sleepless persons, as it will often provoke insomnia when continued for more than a week or ten days.

805. *Poisoning by Caffeine.* A case is noted by Dr. Charles Routh,[1] in which ʒj. of caffeine was administered by mistake. Giddiness, purging, vomiting, and extreme diuresis were provoked. Pain was experienced along the whole alimentary tract. Dr. Routh provoked emesis, and gave stimulants—nitrite of amyl, and subsequently nitroglycerine : recovery occurred.

806. Colchicum Autumnale. Meadow Saffron.

Med. Prop. and Action. The corm or bulb, collected about the end of June, and the ripe seeds (*off.*) are acrid, purgative, diuretic, and sedative, in doses of gr. iij.–v. thrice daily or oftener. They contain a poisonous principle, *Colchicina* or *Colchicine;* and a peculiar acid, *Cevadic Acid.* In small doses, colchicum increases the secretions generally, particularly those of the liver and mucous membrane of the intestines. In a full dose it purges copiously, allays pain in a remarkable manner, and depresses the action of the heart and arteries; in some persons it gives rise to intermissions of the pulse; the motions produced by it are copious, frequent, and of a highly bilious character; the fæces, though solid, are surrounded with mucus, and its operation seems more analogous to that of the saline purgatives than of any other cathartic. Its sedative influence, though sensibly connected with its evacuant effects, is not, however, solely dependent upon them, and the number of motions may be very considerable without any proportionate depression of the strength ensuing. The action of colchicum on the urine has long been a *quæstio vexata.* This subject, however, has been carefully examined by Dr. Garrod, who draws the following conclusions :—1. That there is no evidence to prove that colchicum produces its effects upon the system by causing the kidneys to excrete an increased amount of uric acid, but that in fact the reverse would seem to hold good. 2. That colchicum is not always diuretic, but often diminishes the renal secretion, especially when its action is exerted upon the alimentary canal. 3. That it has no marked influence on the excretion of urea. These conclusions are drawn from careful analysis of seventy-two cases. From idiosyncrasy some persons are unable to take even the smallest dose of colchicum without its producing serious constitutional disturbance. Externally applied, it is anodyne.

[1] Lancet, 1883, p. 680.

807. *Therapeutic Uses. To Gout*, colchicum has been said to hold nearly the same relation as cinchona does to ague, and so far as individual attacks are concerned the similarity certainly holds good; but, unlike cinchona, colchicum has no power to prevent a return of the disease. So far from that, it is the opinion of many that its use, especially if carried to an undue extent, rather predisposes to subsequent attacks. Its power of controlling gouty inflammation is very remarkable. In articular gout it may be advantageously administered during the time that the inflammatory symptoms are present, and ℥x.–xx., or even ℥xxv. of Vinum Colchici may be given every six hours. Thus given, it will be sufficient in most cases to cut short the gouty attack: and Dr. Garrod states, that though he has often trusted to it alone, yet in the majority of cases it is advantageous to combine it with other remedies, especially with alkalies, amongst which potash and lithia hold the foremost place. It is of importance at the same time to keep up an action of the bowels, and as saline purgatives are desirable, many of them acting remotely as antacids, and all of them tending to relieve portal congestion, recourse may be had to Sir C. Scudamore's "White Mixture," which was formerly a popular remedy:—℞ Magnes. Sulph. ʒj.–ʒij., Acet. Colchici (Lond. Ph.) ʒj., Magnes. Carb. gr. x.–xv., Aq. fʒjss. M. ft. haust., 6tis vel 8tis horis sumend. The state of the skin and kidneys require at the same time to be attended to. Colchicum, according to the same authority, is equally efficacious in subduing the exacerbations of *Chronic Gout* as in combating the early fits in the acute disease, due regard being paid to the strength of the patient, and the dose regulated accordingly. In these cases it may often be advantageously combined with guaiacum, iodide of potassium, quinia, &c. Doubts are entertained by some as to the use of colchicum in chronic cases, but Dr. Garrod considers that the permanent danger caused by allowing the inflammation to linger for a long period in the system is far greater than any injury which the proper use of colchicum can entail. This remark applies equally to the employment of this remedy in acute cases. These remarks may be taken to refer also to rheumatism, and especially the symptoms grouped together under the title of *Rheumatic Gout*.

808. *In Gouty Iritis*, colchicum forms an excellent adjunct to other remedies.

809. *In the Lithic or Uric Acid Diathesis*, particularly if occurring in gouty subjects or free livers, colchicum is often very useful. In the first instance, ℥xv. of Vinum Colchici may be administered twice or thrice daily; afterwards a saline aperient, and from xl.–l. drops may be occasionally given in the morning with advantage.

810. *In Cystitis of Gouty subjects*, colchicum is a valuable adjunct to Pareira brava, or buchu. Given alone, it will in many instances afford great relief, if not effect a cure. In the *Nephritis of Gouty subjects*, it is useful, conjoined with magnesia. *In Orchitis*, occurring in the same class of persons, it is sometimes productive of excellent effects. *In Senile Enlargement of the Prostate Gland*,

it sometimes proves useful. This is, in a measure, accounted for by the fact that this affection frequently occurs in persons of a gouty diathesis.

811. *In Chronic Bronchitis*, the value of colchicum was pointed out in 1820 by Dr. Hastings. It is doubtless the active ingredient in the formula employed with great success by Dr. Greenhow[1] in *Gouty Bronchitis*:—℞ Potass. Iodid., Ammon. Carb. āā gr. iv., Vin. Colchici ♏x., T. Scillæ, T. Hyoscyam. āā ♏xx., Aq. Camph. q.s. Ft. haust. ter die sumend. This is for the acute or early stage; in the more advanced, the mineral acids or iron are indicated.

812. *In Chronic Liver Affections*, colchicum, according to Dr. Garrod, may often be given with advantage to gouty subjects as a cholagogue in lieu of mercurials, and Dr. Murchison[2] describes it as a useful adjunct to other aperients in cases of liver derangement with lithæmia. Dr. Copland (ii. p. 310) states that in several cases of *Jaundice* he derived marked benefit from colchicum in small doses, variously combined with mild mercurials, alkalies, neutral salts, &c., according to circumstances.

813. *In the Dysmenorrhœa* of gouty or rheumatic subjects, colchicum is often of much utility, and during the paroxysm ♏xx.–xxx. of the tincture with small doses of Tinct. Opii and Vin. Antim. Tart., will often give more relief than any other remedies. So long as the bowels are constipated, the tongue foul, and the urine loaded with lithates, colchicum may be given two or three times a day with a small dose of blue pill at night, and when the constipation is overcome, the acetous extract may still be continued at night, while during the day some tonic may be given. (Dr. West, p. 87.) When this fails, the iodide of potassium is often of great service.

814. Collodium. Collodion. Contractile Collodion. A solution of Pyroxylin (Gun-cotton) in Ether and Rectified Spirit.

Collodium Flexile. Flexible Collodion. Take of Collodion fl. ℥vj., Canada Balsam gr. cxx., Castor Oil f℥j. Mix, and keep in a well-corked bottle.

Med. Prop. and Action. Collodion was introduced in 1848 by Mr. Maynard, of Boston (U.S.), as a substitute for adhesive plaster in surgery. It acts on the twofold principle of drawing together and holding in apposition the edges of a wound, and of preserving it from contact with the air.

815. *Therapeutic Uses.* *Wounds* of limited extent may be treated in the following manner by this agent:—The bleeding having been arrested and the skin dried, the edges are to brought in careful apposition, and by means of a camel-hair brush the collodion should be applied lengthwise over the wound, and about half an inch beyond the wound. In a few seconds, the ether having evaporated, the wound will be found covered with a film. When quite dry in order to increase the firmness of the support, a second

[1] On Chronic Bronchitis, &c. 1869, London. [2] Brit. Med. Journ. May 2, 1874.

layer may be applied in the same manner as the first. *Superficial Hæmorrhage from Leech-bites, Cupping*, &c., may often be speedily arrested by its application.

816. *In Skin Diseases*, the flexible collodion (B. Ph.) proves useful in many ways. So observes Dr. A. Jamieson,[1] who adds that in restraining the advance of *Erysipelas migrans*, particularly in children, he has often found it of great value. When *Burns of the Skin* do not advance beyond the first grade, a coat of flexible collodion serves to preserve the vesications from rupture, and in no way interferes with treatment by cotton wool. Its applicability to various forms of *Herpes* is well known, but less so its value *in Chronic Eczema of the Palms*, when it lessens the itching and helps the fissure to heal. (Dr. Jamieson.) Dr. H. Lawson[2] relates two cases of *Eczema* (*E. genitale* and *E. capitis*) successfully treated with flexible collodion. *In Herpes zoster*, Dr. Anstie[3] observes, the main points to attend to are to exclude the air by the constant reapplication of flexible collodion, and to mitigate the pain by the subcutaneous injection of morphia (gr. $\frac{1}{2}$) as frequently as necessary. It has been proposed as a means of *preventing Pitting in Small-pox*, but its utility is very doubtful.

817. *In Puerperal Fever*, Dr. Playfair (ii. p. 330) states that he has found the free application over the abdomen of flexible collodion (B. Ph.) decidedly useful in alleviating the suffering from peritonitis.

818. *In Gout*, painting the affected joint with flexible collodion gives great relief to the pain. Care should be taken that in applying the remedy, hairs are not included, or the drag upon them during the contraction of the collodion will cause pain.

819. *Boils*. These often commence in the form of a small pimple, which soon matures, and forms a pustule, around which the inflammation extends till a hard, red, painful swelling occurs; the centre of which dies, leaving a core. In such cases collodion applied in the earliest stage is often effectual in arresting its development. Should it fail in effecting this it should be still persevered with, as it allays pain and irritation, and apparently hastens the curative process. This treatment, proposed first by Dr. Hare, is favourably noticed by Dr. Ringer (p. 319). *Carbuncles*. Dr. Seiche, in twelve cases, tried the plan of surrounding the inflamed part with a zone of collodion, so as to exert pressure upon the base of the swelling, leaving the central portion exposed for the escape of the softened tissues. By this procedure it appeared that extension of inflammation was prevented, the pain alleviated, and the duration of the affection materially abridged. (Stillé.) *For preventing Bed-sores*, flexible collodion has been used with good effect in some cases.

820. *In Deafness and Deranged Sense of Hearing arising from Relaxation of the Membrana Tympani*, Dr. McKeown[4] has successfully employed contractile collodion. He found that this, applied on the membrane, firmly contracted it to a greater or lesser extent whilst it remained adherent, and also exerted a permanently bene-

[1] Practitioner, Sept. 1881.
[2] Lancet, June 23, 1877.
[3] Practitioner, Oct. 1871.
[4] Dublin Med. Journ. June 1880.

ficial influence on the relaxation ; this fact he put to the test in a case of three years' standing, and a cure was effected by two applications. No other treatment of any kind was adopted. Dr. McKeown's paper is a highly instructive one.

821. *In Entropium, or Inversion of the Eyelids,* collodion has been successfully employed by Sir W. Bowman. He directs the lid to be restored to its natural position, while the collodion is being applied, by making gentle pressure outwards on the integument below the canthus. In this way the skin of the lower lid is horizontally grooved, while at the same it is left exposed so as to receive the collodion. It should be held in this position until the collodion has contracted at least to such a degree as may be sufficient to maintain the right position of the lid during the further stages of the contraction. One application is generally sufficient; in some instances it requires to be repeated. To insure its success, the collodion should be concentrated; the surface of the lid should be perfectly dry ; the patient's head should be inclined to one side, to allow the tears to run out at one corner of the eye, and not over the lid and cheek; and finally, the collodion should not be removed for some days. Two cases of *Chronic Entropium* thus successfully treated are related by Mr. W. Batten, One of his cases was thus treated as far back as 1847.

822. *In Orchitis,* Hill and Cooper (p. 556) speak favourably of contractile collodion applied freely to the scrotum, especially when the patient is compelled to move about. The ether, they remark, acts as a counter-irritant, and after its evaporation a thick film is left on the skin. This contracts and slightly compresses the parts within. It may be applied once or twice daily while the acute stage continues.

823. *In Incontinence of Urine in Children,* Sir D. Corrigan[1] advocated the local application of collodion. The prepuce is to be slightly curved up, and over the little cup thus formed collodion is to be applied by means of a camel-hair pencil. Almost as fast as applied the collodion solidifies. In contracting it draws closely together the edges of the prepuce, and thus the exit for the escaping urine is closed. When it is desired to pass water, the little wedge or cup of collodion is easily removed with the finger-nail, and may be replaced as required. A fortnight's use sometimes suffices for a cure.

824. *Painful Fissures of the Nipple* are often successfully treated by bringing the edges together, and keeping them in apposition by means of collodion. *Fissures of the Lips, Hands,* or other parts may be treated in the same manner.

825. Colocynthidis Pulpa. Colocynth.

Med. Prop. and Action. Powerful drastic cathartic, but from its extreme acridity it is rarely given uncombined with carminatives, &c. According to Dr. Rutherford it is a powerful hepatic as well as intestinal stimulant when given in large doses. The compound extract is the most eligible form for its

[1] Dublin Quart. Journ. Feb. 1870.

administration. Combined with podophyllin or blue pill, it is one of the most generally useful purgatives we possess. Its activity depends upon a bitter principle, *Colocynthin*. It is said to act chiefly on the large intestines, and occasionally causes griping or tormina, nausea, and vomiting. To obviate these effects, it is advisable to combine it with camphor, which is said to increase its purgative action, at the same time that its influence on the sentient nerves is greatly diminished. Henbane also modifies its action. When applied to an ulcerated or abraded surface, it acts as a brisk purgative; and Orfila states that gr. cxx. of the pulp, applied to the cellular tissue of the interior of the thigh of a man, caused death in twenty-four hours. In large doses it acts as an irritant poison, provoking inflammation of the mucous membrane of the intestinal canal.

826. *Therapeutic Uses. In Constipation*, the compound extract or compound pill (gr. v.–x.) combined with small doses of blue pill, ipecacuanha, podophyllum, or nux vomica, as indicated in each case, is a safe and effectual remedy. Dr. Crichton[1] recommends the Prussian tincture (Colocynth. Pulp. ℥j., Star Aniseed ℥j., Spt. Rect. Oj.) in doses of ♏x.–xx. *In Habitual Constipation*, he states that ♏v.–x. in a little water, taken about an hour before breakfast, suffices to ensure a full evacuation.

827. *In some forms of Dyspepsia and Gastrodynia*, Pil. Coloc. et Hyoscyam. variously combined, as advised in a preceding section, is often productive of good, but it is inadmissible if inflammatory symptoms are present. The following pills, recommended by the late Dr. James Johnson, have been found useful:—℞ Ext. Coloc. Co. gr. xl., Pil. Rhei Co. gr. xx., Saponis gr. vj., Ol. Caryoph. gutt. iv. M. ft. pil. xvj., one or two pills at bedtime.

828. *In Dropsical Affections*, particularly when connected with disease of the liver, colocynth proves useful as a hydragogue cathartic, but it is inferior in efficacy to elaterium.

829. Conium Maculatum, *Linn.* Spotted Hemlock.

Med. Prop. and Action. The leaves and dried fruit (*off.*) are narcotic, anodyne, and antispasmodic, their activity residing in a peculiar volatile, oleaginous alkaloid, *Conia*. Hemlock acts as a depressor of the muscular movements, but the effect is influenced by the state of the muscles, whether they are in action or at rest. The action of conia has been shown by Kölliker and many others to be exerted upon the nervous system and not upon the muscles. These retain their contractibility until death. The cerebrum is but little affected, consciousness being retained till late. The pupils are generally dilated, but not always; while ptosis occurs. It possesses powerful local influence, acting as an intense irritant to mucous membranes. If a vigorous adult man take five or six fluid drachms of the Succus Conii during exercise, in half or three-quarters of an hour he experiences a feeling of being tired, with some giddiness and feeling of heaviness over his eyes; in an hour the sense of fatigue has gone off, and in another hour he is as active as ever. If the same quantity be taken at rest, the eyes become first affected, the adjusting function is interfered with; then succeed drowsiness and dilatation of the pupil; then weakness of the legs—he becomes pale, cold, and tottering; the pulse is regular, and of undiminished force and volume; there is a diminution of muscular power in every part of the muscular system, and almost paralysis of the hamstrings and levator palpebræ. These symptoms reach their maximum in about two hours, and within three hours and a half quite disappear. The succus was administered to several persons in doses of f℥iij.

[1] Brit. Med. Journ. Nov. 28, 1868.

to ʒj., with similar symptoms: but in doses short of fʒiij.–iv. there were no appreciable symptoms. The action is uniform and invariable in man and in all other animals. There is depression of the motor function of the third nerve, a lazy movement of the eyes, and sometimes strabismus, with imperfect adjustment of the refracting media of the eye. The full action of hemlock is sleep. The pulse is at first diminished, then increased in frequency. Sometimes burning sensations in the mouth, fauces, nausea or vomiting may occur. (Wood, 378.) Death arises from complete muscular paralysis, which attacks in turn the diaphragm and intercostals; and the breathing ceases. Sweating and salivation are occasionally present in conia poisoning. Prevost paralysed frogs with the urine of animals poisoned by conium. Its action is influenced by muscular activity more than by muscular power. The sedentary, with abundance of strength, are more affected than the delicate but active. A delicate child will often take as much as would reduce some strong men to a tottering condition; hence, the dose must be proportioned to the degree of motor activity of the individual, whether child or adult. It produces no pure cerebral effects; the irritability of the spinal cord is diminished; there is no evidence of distinct interference with the sensory functions. These effects are in the main closely analogous to those observed by Dr. J. Wilkie Burman[1] following conia subcutaneously injected. Locally applied in the form of a poultice of fresh leaves (Cataplasma Conii), conium acts mildly as an anodyne; as a substitute for this poultice, Dr. Harley advises a piece of lint saturated with the succus; or, if heat and moisture be required, a bran poultice containing ʒj.–ij. of the succus may be used.

For the purpose of inhalation, the B. Ph. directs a Vapor Coniæ (Ext. of Hemlock gr. lx., Solution of Potash fʒj., Water fʒx. M. Put ♏xx. of this mixture on a sponge in a suitable apparatus, so that the vapour of hot water passing over it may be inhaled). Dr. Harley, objecting to the use of the extract for this purpose, proposes the following as a substitute:— Conia gr. j., Alcohol fʒjss. Dissolve the conia in ♏xxx. of the alcohol, and add the remainder, mixed with fʒij. of water: ♏xx. contain gr. $\frac{1}{15}$ of conia. Protected from strong lights, this solution may be kept unimpaired for a long time.

830. *Therapeutic Uses. Chorea.* Dr. Harley, regarding this disease simply as a primary disorder of the nervous system, and acting on his conclusions with regard to the physiological action of this remedy, employed hemlock in several cases of chorea with excellent results; but it has signally failed in the hands of Anstie[2] and others, though given in large and long-continued doses. It is evidently a remedy of very secondary importance in this disease. The same remark applies to *Epilepsy*, in which it is also recommended by Dr. Harley (p. 29). He restricts its use to cases arising from sexual abuse, or from the irritation of dentition.

831. *Undue Excitement of the motor centres occurring at or near the period of Dentition, and producing general irritability of the system with strong tendency to Convulsions, and in many cases resulting in actual Convulsions.* Dr. Harley states that he has treated eleven cases, presenting every variety and degree of irritation, and that all recovered under the use of hemlock; the slighter cases with great rapidity. He regards hemlock as essentially a children's medicine.

832. *In Tetanus*, the use of hemlock was suggested by Mr. De Morgan, with the view of diminishing the irritability of that portion of the nervous centres which controls the reflex muscular

[1] Practitioner, Dec. 1872.

[2] Practitioner, June 1874.

action. A striking case, in which it was successfully employed, is recorded by Dr. Corry.[1] Five grains of the extract were given every third hour. To this disease, observes Dr. Harley, whether arising from inflammatory irritation of the nerve centres, or from the tetanizing action of strychnia on the brain, conium is the natural antagonist; but to be effectual the full physiological effect of the drug must be obtained, and for this purpose the succus should be given in large doses. If the patient cannot swallow, from ʒvj. to ʒjss. or ʒij. of the succus, warmed to the temperature of the body, should be injected into the bowels, and repeated every two, three, or four hours, according to the condition of the muscles.

833. *In Acute Mania*, Dr. J. Wilkie Burman[2] testifies to the value of the subcutaneous injection of conia (♏⅙ to ♏j.), the effects of which are prolonged and apparently rendered safer by being conjoined with morphia. He details seven cases in which this combined injection acted beneficially. The value of conium in these cases is also set forth by Dr. Crichton Browne,[3] who agrees with Dr. Harley in believing in its power to subdue undue activity of the motor centres.

834. *In Sciatica and other Neuralgic Affections*, the extract, given to the extent of producing its constitutional effects, is occasionally serviceable, but is inferior in power to belladonna and opium; but when these are contra-indicated or fail in affording relief, it may be resorted to, both internally and locally. *In Chronic Rheumatism*, it proved very successful in the hands of Dr. Neligan;[4] in *Mercurial Tremor*, full doses were found by Mr. M'Whinnie more effectual than any other remedy. Dr. Harley cites some cases of *Paralysis Agitans* benefited by it; and in four cases of *Nocturnal Cramps of the Limbs*, two of them very severe, speedy alleviation followed its use in his practice. He likewise found it effectual in relieving other forms of *Muscular Convulsive Action*.

835. *In Spasmodic Contractions of the Stomach and Œsophagus*, associated with crampy pains of the stomach, flatulent eructations and globus hystericus, conium, in Dr. Harley's hands, has proved very serviceable.

836. *In Spasmodic Cough, Laryngismus Stridulus, and Pertussis*, conium will be found very serviceable. It requires to be given in full doses in order to produce a soothing effect. For a child a few weeks old he prescribes ♏xx.–xl. of the succus; and for one a year old, ♏lx. or more, repeated thrice daily. Its effect should be watched. *In Spasmodic Asthma*, the inhalation of vapor coniæ promises to prove serviceable.

837. *In Organic Disease or Functional Derangement of the Spinal Cord, attended by excessive Irritability of the Reflex Function*, conium will be a most suitable remedy. (Dr. Harley.)

838. *Sexual Excesses.* In those cases of exhaustion and irritability which arise from early self-abuse, in those of troublesome

[1] Dublin Quart. Journ. of Med. Nov. 1860.
[2] Practitioner, Dec. 1872, p. 335.
[3] Lancet, 1872, vol. i. pp. 143, 182, 217.
[4] Dublin Med. Journ. xxviii. p. 199.

irritation where the patient has been suddenly deprived of the legitimate means of gratifying his desires, and in those cases of erotic tendency that arise from some obscure irritation of the lumbar portion of the spinal cord, Dr. Harley states that he has never known conium fail to give relief. It is very remarkable, he adds, that while it possesses such decided influence over the morbid conditions of the sexual functions, conium should be incapable of depressing the natural function.

839. *In Cancer*, hemlock was formerly held in high repute, but it has fallen into disuse as a curative agent. Its administration *in painful Scrofulous, Syphilitic, and Phagedœnic Ulcerations* may in some cases relieve pain: the muscular fibres are relaxed, and hence tension is lessened; but to obtain this benefit it is necessary that the full physiological effects of the drug should be observed. As a local application in these cases, hemlock poultices, or lint saturated with the succus, placed over the diseased surface, prove useful as an anodyne. It has long been thought to exercise specifically good effects in *Ulceration of the Tongue*. *In Cancer of the Stomach*, Dr. Walshe reports favourably of the extract in gr. x. doses in allaying pain and irritability; and Dr. Harley speaks of its utility for these purposes in *Cancer of the Pylorus*, and in a case of *Cancer of the Rectum*.

840. *In Uterine and Ovarian Disease*, conium seems to be specially indicated. Dr. Dewees (p. 274) found it relieve pain in *Uterine Cancer*, given internally, and used in the form of injection (Ext. Conii ʒiij.–ʒiv. Aq. Oj.). Of all the anodynes we possess, Dr. A. Meadows[1] considers that none can compare with conium as an anodyne to the generative and sexual organs; its influence on the ovarian nerves he regards as quite remarkable. Of its value in ovarian disease, specially *Ovarian Menorrhagia*, he is quite satisfied; but he is not quite so sure of it in the case of *Uterine Fibroid Tumours*, though here it is also calculated to give relief. His estimate of it, or of its alkaloid, in this class of cases, is very high. He advises gr. j.–ij. of conia, in the form of vaginal pessaries, once or twice a day as required. For his form of pessaries see article Glycerine.

841. *In Inflammation of the Breast and impending Milk Abscesses in Puerperal Women*, Dr. Altstadter,[2] of Pesth, strongly recommends the extract in small doses several times daily. He reports several cases in which striking advantage was obtained from its use.

842. *In Chronic Bronchitis, obstinate Coughs, and irritable state of the Air-passages*, the compound pill (gr. v.–x.) is a very useful formula. The addition of squill increases its efficacy in chronic cases. Benefit is also often derived from the inhalation of Vapor Coniæ (*ante*). The *Cough of Phthisis* is also sometimes greatly relieved by this inhalation.

[1] Lancet, 1873; and Brit. Med. Journ. July 12, 1879.

[2] Wiener Med. Presse, No. 12, 1871.

843. Convallaria Majalis. Lily of the Valley.

Med. Prop. and Action. The flowers and the whole plant have enjoyed a good reputation in Russia for many years in treatment of dropsy. The active principles are two glucosides: Convallaria and Convallamarin. Their physiological actions have been made the subject of careful research by Botkin. According to Labbée,[1] the physiological action of Convallaria is to stimulate the vagus, which it afterwards paralyses. The heart's action becomes in the first instance slowed, later it is quickened, while finally the motor centre of the heart is placed *hors de combat.* Arterial pressure, at first heightened, subsequently is diminished. The respiration is also affected, being initially quickened, but at length slowed. Salivation with vomiting and purging ensue upon the exhibition of large doses. The preparations are—an Extract, gr. ij.–viij.; Liq. Extr., ɱij.–x.; Tincture, ɱv.–ʒss.; Convallarin, gr. iij.–v.; Convallamarin, gr. j.–iij.

844. *Therapeutic Uses. In Cardiac Diseases.* The Russian physicians, who introduced lily of the valley to the profession, claim for it an action similar to that of digitalis, while it possessed none of the bad effects of that drug. Most observers find convallaria useful, although certainly less reliable than digitalis. It has no cumulative action, and seldom excites nausea or vomiting. In the cases in which digitalis is useful, convallaria will usually succeed. Thus in *Mitral Disease*, it is of great service, possessing both the qualities of strengthening and steadying the heart while it drains anasarca. *In Mitral Incompetence*, Dr. Sée has found it of great service, and Dr. F. T. Roberts narrates a case[2] of this disease which was complicated with bronchitis, pleurisy, and ascites, in which convallaria succeeded, even after digitalis had been unsuccessfully tried. Labbée (*op. cit.*) finds it calms *Palpitation* and lessens *Dyspnœa*, and restores rhythm to an *Intermitting Heart.* Its use cannot be said to be wholly free from danger. Dr. Herschell[3] published a case in which alarming symptoms followed its exhibition.

845. *Organic Disease of the Heart.* The same authority regards the action of convallaria and digitalis as identical in these cases. It would appear, however, the convallaria is of service in aortic disease, and even when foxglove cannot be used. In incomplete compensation and in dilated heart it yields good results. As to its powers as a diuretic opinions are divided, but most observers lean to the view that it relieves the dropsy of heart disease, mainly, if not wholly, by its action upon the heart. Dr. Dujardin-Beaumetz uses it alternately with digitalis, and he regards it as the safer medicament.

846. *In Diseases other than Cardiac*, the trials of convallaria have been disappointing. It has been given in *Typhoid Fever*, in *Pneumonia* and *Pleurisy*, but without marked benefit. In *Cardiac Palpitation*, resulting presumably from vagal exhaustion, it is of especial value.

847. *Exophthalmic Goitre.* The painful palpitation of Graves' disease is greatly ameliorated by convallaria. (Stillen.[4]) Although

[1] Gaz. Hebdom. 1884, xxiv.
[2] Practitioner, 1884, p. 265.
[3] Lancet, Oct. 1883.
[4] Wien. Med. Wochensch. 1883, pp. 44–46.

commended in *Cardiac Dyspnœa*, yet it is probably far inferior to iodide of potassium or morphia in treating this symptom.

848. *Asthma* due to heart disease, or emphysema, is, according to Bianchi,[1] benefited by convallaria.

849. Copaiba. Copaiva. Balsam of Copaiva.

Med. Prop. and Action. Stimulant of mucous surfaces generally, particularly that of the genito-urinary system. When continued in repeated doses for a few days, it causes a slight purging, which may be regarded as a sign that the system has become affected. The urine is generally greatly increased in quantity, and smells of the remedy, which may be separated from it by ether; it is stated to be of an intensely bitter taste, and has a copious froth or head, which remains more or less for several hours. Its *modus operandi* is obscure, but it appears probable that it operates by exciting a new action in irritated mucous surfaces. The odour may be detected in the breath. It contains (1) a volatile oil which is thought to act more especially on mucous membranes; (2) a small quantity of a brown, soft, or viscid resin; and (3) a hard resin having acid properties and constituting more than 50 per cent. of the oleo-resin. It is the last-named that Dr. Wilks[2] discovered to possess powerful diuretic properties, which have been fully confirmed by subsequent observers.

Remarks on its Administration.—1. In some persons, copaiba, even in small doses, produces violent vomiting and purging. In these cases it should not be persevered with. 2. If it do not soon produce a moderate purgative effect or an improvement in the symptoms, it should be discontinued. 3. In some persons copaiba causes febrile reaction and an erythematous rash (*Copaibal Erythema*). This rash is raised, of a deep red colour, and is most pronounced on the dorsal surfaces of the hands and feet. The wrists, knees, and elbows also are favourite seats of the eruption, which is often more or less confluent in these situations. From thence it may spread rapidly, sometimes over the whole body. The temperature may be raised, and the patient feel ill and depressed. The itching is usually extreme, but in some rare cases absent. Scratching often occasions wheals, resembling severe urticaria; the face also sometimes becomes swollen, and the eyes congested and watery. The eruption usually disappears in a few days, even when the remedy is continued; but it is advisable to discontinue it, and prescribe a purge and a warm bath, which is all the treatment required. (Hill and Cooper, p. 513.) 4. Its effects are thought to be attained more readily by small doses frequently repeated than by large ones at longer intervals.

Dose of Copaiva, gr. xx.–℥j. Liquorice gr. x.–xx. to each dose is said to disguise its taste. Sugar equally so. Boluses of copaiba and cubebs incorporated, and coated with magnesia, are sometimes borne when copaiba in a liquid state is rejected; or it may be given in gelatine capsules, 6 to 20 per diem. *Dose of the Oil*, ♏v.–x.–xx. in emulsion. *Of the Resin*, gr. xv.–xx. in mucilage and aromatic water three to four times daily.

850. *Therapeutic Uses. Diseases of the Genito-Urinary System. In Gonorrhœa*, copaiba is a remedy of established value. The following formula is commonly employed, and with much success:—℞ Copaibæ, Spt. Ether. Nit. āā f℥ij., Liq. Potas. f℥j., T. Hyos. ♏xl., Aq. Menth. Pip. f℥iv., Mucilage Acac. f℥ij., M. f℥j. to be taken three times a day. Some practitioners prefer the oil, which may be advantageously given thus:—℞ Oil of Copaiba f℥j., Oil of Cubebs f℥j., Sweet Spirits of Nitre f℥j.

[1] Gaz. degli Ospitali, 1883.

[2] Lancet, March 22, 1873.

M. Dose, gutt. xx.–xxx. The good effect of copaiba depends almost entirely on its being given when the mucous membrane is ready for it: if given too early it fails to do good, and sometimes does harm: neither should it be given when there is persistent pain in the loins, or albuminuria. The most favourable period is when the pain on passing water is nearly gone, when painful erections are at an end, and when the discharge has become less in quantity, yellow rather than greenish, and viscid rather than purulent. *Much* pain in passing water is always a sign that specifics will do harm; so also is a congested bright or livid red state of the mucous membrane, with copious discharge. In all cases it is best to give as much as the patient will bear without inconvenience; this point can only be decided by trial, but usually ʒss. to ʒij. per diem in divided doses, as much as can be borne without nausea, indigestion, &c. The best time for taking it is between meals, before the stomach is empty. The patient should avoid drinking much, that the effect of the copaiba may not be weakened by diluting the urine. (Hill and Cooper, pp. 512, 513.) Cases of *Gleet* have been known to yield to the use of a bougie smeared with copaiba.

851. *In Leucorrhœa*, copaiba is sometimes eminently serviceable. Dr. Churchill[1] speaks highly of it, in doses of ℥xv. thrice daily. Dr. Dewees (p. 80) also states that he has occasionally succeeded with copaiba when other remedies had been fully tried without advantage.

852. *In Hœmorrhoids or Piles* of long standing, particularly when occurring in old persons, copaiba, in doses of gutt. xv.–xxv. thrice daily, is productive of great benefit. To old persons the taste of copaiba is not generally unpleasant.

853. *In Subacute and Chronic Cystitis*, Dr. West (p. 600) states that he has often seen benefit from pareira combined with small doses of copaiba. *In Chronic Vesical Catarrh*, after the subsidence of acute symptoms, Dr. G. Johnson[2] states that copaiba often effects a rapid and complete cure. He directs one capsule to be taken an hour or two after food, thrice daily, gradually increased until six or even nine capsules are taken in three doses in the twenty-four hours. His estimate of it is evidently very high.

854. *In Valvular Disease of the Heart*, copaiba is sometimes useful, according to Dr. Hilton Fagge ("Syst." iv. p. 685). He mentions specially a case of *Mitral Disease* which had resisted various kinds of treatment, in which ascites and anasarca rapidly vanished under the use of a simple copaiba mixture. Drs. Wilks (*op. cit.*), Moxon,[3] Dixon,[4] and others, have recorded cases in which the resin, by its diuretic action, acted most beneficially. The most complete evidence in favour of the resin in this class of cases is that of Dr. F. Taylor,[5] whose observations are based on forty cases. In nearly all, dropsy was the prominent symptom. All the im-

[1] On Diseases of Females, p. 135.
[2] Brit. Med. Journ. May 31, 1873.
[3] Med. Times, May 9, 1874.
[4] Practitioner, Feb. 1875.
[5] Guy's Hosp. Reports, 1876, p. 1.

portant varieties of *Dropsy* are represented, including thirteen cases of *Ascites from Liver Disease*. With the exception of six, the diuretic power of the resin was speedily manifested. In one of the most striking instances, the urine, which measured eighteen oz. on the day the drug was commenced, rose to seventy-six oz. on the following day, but the diuresis so speedily produced may as quickly subside when the drug is withdrawn. In all dropsical diseases the copaiva resin, either alone or conjoined with other drugs, seems worthy of confidence. Usual dose gr. xij.–xviij. in mucilage, thrice daily.

855. *In Croup*, Dr. Lincoln[1] and other American physicians regard copaiba as an important remedy. It is prescribed in drachm doses in all stages of the disease, but is thought to be specially adapted for the early stage. Given at the very outset, it seems to arrest it altogether. *In Diphtheria*, Dr. M. Mackenzie (p. 161) states that in catarrhal cases he has seen distinct benefit from the use of *perles* of copaiba.

856. *In Diseases of the Eye*, copaiba, according to Dr. A. R. Hall,[2] is a remedy of great value. *In Iritis* and *Sclerotitis*, he used it in ʒij. doses, in mucilage, thrice daily, with marked and immediate benefit. In support of its use in iritis he cites the recommendation of Mr. C. Macnamara in his work on "Diseases of the Eye." At Seetapore, in Oude, in 1872, he had under his care thirty children suffering from *Purulent Ophthalmia:* they were all treated by simply painting the lower eyelids, upper part of the cheeks, and temples with copaiba, and they all got well without any damage to the eyes. Dr. Hall does not think the value of copaiba in eye disease is sufficiently recognized.

857. *In Psoriasis*, Dr. Purdon[3] met with great success from large doses of copaiba given with a little liq. potassæ, mucilage, and water.

858. *In Small-pox and Scarlatina*, Dr. Rowand,[4] of Quebec, employed copaiba with very satisfactory results. He gave gutt. iv.–v. with syrup (ʒij.) and mucilage (ʒij.) three or four times daily, with a diet of milk, beef-tea, wine, and spirits, according to circumstances. His theory is, that it alters or destroys the character of the virus, and eliminates it out of the system, by the skin and kidneys more particularly.

859. As a remedy for *Scabies in Children*, Dr. Monti,[5] of Vienna, employed the balsam of copaiba in twenty-seven instances, and in each effected a complete cure. Each child was first washed with soap and water, and then rubbed all over twice daily with the balsam. No other application was used. He found that the itch insect could not live in the balsam beyond two or three hours.

860. *Diseases of the Lungs*, when attended with excessive secretion, are often benefited by copaiba, which exercises a powerful influence over the pulmonary mucous membrane. *In Chronic*

[1] Practitioner, May 1875.
[2] Practitioner, April 1875.
[3] Dublin Med. Journ. May 1871.
[4] Med. Times, Feb. 17, 1872.
[5] Practitioner, Oct. 1871, p. 238.

Bronchitis, Bronchorrhœa, and Chronic Coughs attended with profuse expectoration, copaiba has been advised by Armstrong and others. Dr. C. J. B. Williams states that he has often seen it restrain and modify the bronchial secretion. It is particularly useful in old persons. It is inadmissible when fever or much vascular irritability exists.

CORROSIVE SUBLIMATE. See HYDRARGYRI PERCHLORIDUM.

861. CREASOTUM. Creasote.

Med. Prop. and Action. Stimulant, sedative, rubefacient, and antiseptic. It possesses the property of immediately coagulating albumen; and to this may be ascribed many of its effects on the living system, and its power of preserving for months meat which has been saturated with it. When added to the blood, the latter thickens and becomes reddish brown, with small white spots, probably coagulated albumen; on further exposure to the air, the blood acquires a yellowish red colour. When applied to the tongue, creasote causes violent pain, but without redness or tumefaction; a strong taste of smoke extends to the throat, and there is a copious flow of saliva. Taken internally in small doses, it occasions a sensation of warmth in the stomach, expels flatus, with eructations smelling strongly of creasote, and appears to exercise a peculiarly sedative action on the stomach. It increases the flow of urine, to which it communicates its odour. In over-doses it produces the following symptoms, as observed by Mr. Macnamara:—Profound stupor, from which the patient could only be roused for a minute; the countenance flushed, and fuller than natural; the eyes fixed, but the pupils neither dilated nor contracted; the pulse slow and laboured; the heart's action remarkably slow and weak; the stomach irritable, and the ejecta bearing a strong smell of creasote. When aroused, vertigo and uneasiness in the head were complained of; and also a burning pain along the œsophageal tract, and in the stomach. Stimulants, the cold douche, and mustard emetics relieved the patient. Applied pure to a bleeding surface, creasote is styptic.

Dose:—Of Creasote, ♏j.–iij. in pill or following mixture. *Of the Mixture* (Creasote ♏xvj., Glacial Acetic Acid ♏xvj. Spt. of Juniper ʒss., Syrup ʒj. Water ʒxv.), ʒj.–iij. *For External Use:—Ointment* (Creasote 3j., Simple Ointment ʒj.) *For Inhalation:—Vapor Creasoti* (Creasote ♏xij., Boiling Water, ʒviij.) Mix and place in proper apparatus for inhalation.

862. *Therapeutic Uses. In Gastric Irritability and Vomiting,* creasote is of doubtful value. In inflammatory conditions of the stomach it aggravates rather than relieves the symptoms. It occasionally proves useful in *Gastrodynia,* but in this and other affections of the stomach it should not be given in pill with oxide of silver, unless the latter be first mixed with liquorice powder, otherwise the mass will take fire.

863. *Fœtid Eructations* will generally yield to creasote (♏$\frac{1}{4}$–$\frac{1}{2}$ in pill) given with each meal. (Dr. Pavy.) *The distressing Flatulence of Hypochondriasis* may be greatly relieved by creasote, gutt. j. in pill twice or thrice daily. (Gull and Anstie.[1])

864. *In Diarrhœa,* creasote sometimes acts effectually. Dr. Kesteven found it so uniformly successful that he rarely used any other than the following formula:—℞ Creasoti ♏j.–iv., Spt.

[1] Reynolds' Syst. of Med. ii. p. 305.

Ammon. Arom. ℥xv., Aq. fʒss. M. When there was much pain, T. Camph. Co. was added. He attributes its influence to its coagulating properties.

865. *In Phthisis*, the inhalation of creasote is often attended with mitigation of cough and other distressing symptoms, but to be of any real service the inhalation should be continuous, and this can best be effected by the common use of the medicated respirator, as advised by Dr. Hunter Mackenzie.[1] He prefers a mixture of creasote ¾ and carbolic acid (Calvert's No. 1) ¼ part. A cheap extemporaneous respirator is described by Dr. Wilson Hope,[2] who is convinced that creasote vapour (5 to 10 drops placed between two layers of wadding in the apparatus) is useful in many cases of *Phthisis*, also in *Chronic Bronchitis*, and in *Diffuse Capillary Bronchitis in the young*. Dr. Yeo[3] and others have also testified to its use in these cases, especially when the expectoration is excessive or putrid. It also corrects the fetor of the sputa in *Dilatation of the Bronchi* and *Pulmonary Abscess*. (Garrod.)

866. *In Chronic Laryngitis*, the following is spoken of as a useful steam inhalation by Dr. M. Mackenzie:—℞ Creasoti, Glycerini āā ʒiij., Aq. ad ʒiij. M. A teaspoonful to Oj. of water at 150° F. and used as directed under Pinus sylvestris (*q.v.*).

867. *In the advanced stages of Cancer of the Uterus*, Dr. West (p. 406) advises a creasote lotion (ʒj., Mucilage Oj) as having a remarkable influence in removing the offensive smell.

868. *In Toothache*, a single drop of pure creasote, applied to a carious tooth, occasionally affords immediate relief.

869. *In some Diseases of the Skin*, creasote ointment has been found useful; particularly in *Prurigo Senilis*, *Lepra*, *Psoriasis*, and *Impetigo*. *In Psoriasis*, Mr. B. Squire[4] testifies to the value of a combination of creasote (2 parts) and white wax (1 part). Should this cause much pain, as it is apt to do in persons of a lymphatic temperament, the proportion of creasote may be reduced one-half. He regards it as far superior to the ordinary pitch ointment. Dr. McCall Anderson[5] states that he has found this ointment very useful, but sometimes too irritating. *In Ringworm*, pure creasote rubbed into the surface is stated to be efficacious. *In Pruritus Pudendi*, a weak solution is sometimes useful.

870. *In Sloughing and Phagedœnic Ulcerations*, the local application of pure creasote has in many instances been found beneficial. Foul ulcers, according to Dr. Elliotson, become clean, and long-standing ones heal rapidly under its use. *To Indolent Ulcers* a weak solution (gutt. vj.–xij., Aq. ʒj.) may be applied.

871. *To Bedsores*, Reichenbach's Lotion (1 part of creasote to 80 of water) is stated to be an efficacious application. It is also said to be a preventive.

872. *In superficial Hæmorrhage from Wounds, Leech-bites, or after Extraction of Teeth*, creasote is an efficient styptic. It may

[1] Practitioner, Aug. 1882.
[2] Brit. Med. Journ. July 16, 1881.
[3] Med. Times, June 3, 1882.
[4] Practitioner, Nov. 1868.
[5] Lancet, Dec. 4, 1869.

be applied on a piece of lint saturated with it, and applied with pressure to the bleeding point. It has been administered in *Hæmaturia*, *Hæmoptysis*, and other internal hæmorrhages, but without satisfactory results.

873. *In Tape-worm*, creasote was used successfully in two cases by Mr. H. Brickwell.[1] For six or seven days he gave it (gutt. j.–ij.–iij.) in the form of pill thrice daily, shortly after a meal, and followed this up with a dose of castor-oil. He states that he has used it with great success in destroying the *Round-worm* (Lumbrici), but failed in the case of the thread-worm.

874. *Warts* are said to be removable by creasote freely applied, and kept *in situ* for two days by strips of adhesive plaster. It requires subsequently to be applied daily till desquamation ensues. *Nævus* may be removed, according to Bujalsky, by pencilling it twice daily for some weeks with creasote.

875. Creta Præparata. Prepared Chalk.

Med. Prop. and Action. Antacid, absorbent, and astringent. If continued for any length of time, an occasional aperient is advisable, as it is apt to accumulate in the bowels, and form intestinal concretions. Like liquor calcis, it appears to have the effect of diminishing the secretion of the mucous membrane of the intestines, besides correcting any existing acidity. Hence it is termed an astringent. Externally it is applied in fine powder to ulcers and excoriations.

876. *Therapeutic Uses. Diarrhœa arising from acidity of the primæ viæ, and some other forms of the disease*, often yield speedily to chalk mixture, either alone or in combination with other remedies (*infra*). *In the Diarrhœa of Small-pox*, the following mixture is the one ordinarily in use in the Small-pox Hospital, London:— ℞ Cretæ Præp., Pulv. Acaciæ, Sacch. Alb. āā ʒjss., Aquæ ʒiv., T. Opii ʒj., Sp. Ammon. Arom., T. Catechu āā ʒss., Aq. Menth. Pip. ʒiij. M. Coch. amp. ij.–iij. 3tis horis. Whether the first dose seems to have answered the purpose or not, it should be repeated, as without the second dose the diarrhœa will often return. If after three or four doses the diarrhœa continues, recourse should be had to Infus. Rosæ Acidum, or should this fail, to Pulv. Kino Co. (gr. x. every six hours), or to Pulv. Creta c. Opio (gr. xx.–xxx.). (Mr. J. F. Morson, i. p. 456.)

877. *To Diseases of the Skin, Excoriations, Burns and Ulcers, when accompanied by an acrid irritating discharge*, chalk finely powdered, and sprinkled over the surface, is highly useful, absorbing the discharge, and thus preventing the disease extending. An emollient poultice should be placed over the whole surface. *For Chronic Ulcers of the Legs*, Dr. Spender[2] testifies strongly to the advantages of chalk ointment, made by incorporating three parts of finely powdered chalk with two parts of melted lard, stirring thoroughly till nearly cold.

[1] Med. Times, Sept. 18, 1875.

[2] Lancet, May 3, 1873.

878. Croton-Chloral, or more correctly Butyl-Chloral. Prepared by the action of chlorine on aldehyde. It occurs in the form of small glistening foliaceous crystals, of a burning taste, sparingly soluble in cold water, readily so in alcohol and in warm water, volatilized by heat. It should not contain chlorine, which, if present, is precipitated by nitrate of silver.

Med. Prop. and Action. Hypnotic and anæsthetic. According to Dr. Oscar Liebreich, who introduced it into practice, the first action of the drug is to produce anæsthesia, which begins in the head, and gradually passes to the rest of the body, reflex irritability remaining intact in the limbs for some time after it has been abolished in the head. Then follows narcosis; but it is important to observe that anæsthesia in the head and face may be complete before any trace of narcosis manifests itself. Hence Liebreich suggests its use in operations on the face, in cases where other anæsthetics are contra-indicated. For this purpose he places the dose at 15 to 30 grains. Under its use the respirations and pulse remain unaffected. In toxic doses it causes death by paralyzing the medulla oblongata. Croton-chloral possesses, observes Binz, the property of deeply narcotizing the brain without materially affecting the functions of the rest of the organism. Chloroform and chloral, on the other hand, cause general anæsthesia concurrently with deep cerebral narcosis, and hence are much more likely to cause injury to the respiratory organs and the heart than this agent. These observations, it should be added, are not apparently in accord with those of Mering and Wendel Schmidt, cited by Dr. H. Wood (p. 353). Dr. Ogilvie Will[1] expresses his decided conviction, after considerable experience in its use, that of all hypnotics croton-chloral has the least troublesome sequelæ.

Dose:—This has been very variously stated. One dose of ʒj. is said by Liebreich to send an adult into a sound sleep in 15 or 20 minutes, and at the same time to cause complete anæsthesia of the cutaneous nerves of the head. Such a dose is wholly uncalled for, and is doubtfully safe. Every good that is obtainable from it may be derived from 15 to 30 grains, but for the relief of pain the best plan is to give 3 to 5 grains every second or third hour (or even every hour in severe cases) till the dose reaches 60 grains, or until relief is obtained. It is best given with glycerine or in syrup with a little Tinct. Aurant., or other agent, to disguise its unpleasant taste; or it may be given with Conf. Rosæ in the form of pill.

879. *Therapeutic Uses. In Tic Douloureux, Migraine, and other Neuralgic Affections of the Head and Face,* croton-chloral is beyond a doubt a remedy of great power, so much so that Dr. M. Skerritt, considers that in neuralgia of the fifth nerve it may be regarded as almost a specific. Its effect, however, he adds, is not always to be relied upon, certain conditions being more favourable to its success than others; thus, it has the most marked effect in the neuralgias of the young and in the headaches of anæmic females, whilst it is of little use, if any, when hysteria is present. When first given, he remarks, this remedy has only a temporary effect—*i.e.*, when the medicine is left off the pain will return; it is only after a longer course the pain is permanently removed. It appears to have no effect on neuralgias of other parts of the body, or when they are of a rheumatic character. Average dose, gr. iii.–v. twice daily. (See *Dose.*) Dr. B. W. Richardson[3] advises its combination

[1] Med. Press, May 12, 1875.
[2] Lancet, Dec. 29, 1876.
[3] Med. Press, Jan. 19, 1881.

with quinine: ℞ Croton-chloral, Quiniæ, āā gr. ij., Glycerini q.s. ft. pil. To be taken when an attack threatens, and repeated every two hours until relief is obtained. Its use in *Toothache*, in which it has been advised, seems limited to purely nervous cases. *Sciatica* is often benefited by croton-chloral.

880. *In Spasmodic and Irritative Cough*, Dr. Burney Yeo[1] speaks highly of the value of croton-chloral, and considers that there is scarcely a remedy likely to prove more valuable for the relief of the *Night Cough of Phthisis*. He advises giving it in moderate and quickly repeated doses till the tolerance in each case has been discovered. Dr. O. Will[2] states that he has derived much benefit from it in these cases, and he mentions several cases of *Hooping-cough* which yielded to this remedy alone. Further evidence of its use in pertussis is adduced by Dr. Paulson[3] and Dr. Milson Roberts.[4] The latter observes that children bear it remarkably well. He places the dose for a child a year old at one grain every four hours; for a child from six to twelve years old, two grains; for adults, four grains. He also insists on the importance of its regular administration every four hours, night and day, for the first week. The worst cases, he says, generally yield in a fortnight. *Dysmenorrhœa* has been relieved by this remedy.

881. *Photophobia.* To test the usefulness of croton-chloral in relieving intolerance of light in some eye diseases, some trials were made with it by Mr. Bader,[5] of Guy's Hospital, and he concludes that only young people, and only those suffering from *Syphilitic Corneo-Iritis*, are benefited by it. He found gr. v.–x. a most beneficial dose, though in one case he gave gr. xx. four times a day without producing much good or any bad symptoms.

882. Crotonis Oleum. Croton Oil.

Med. Prop. and Action. Drastic purgative, in doses of gutt. ss.–ij.–iij. It may be given in the form of pill with bread crumbs; or, if the patient from any cause be unable to swallow, it may be placed at the root of the tongue, its full purgative action being equally attainable in this latter way. The smallness of the dose required, the rapidity of its action, and its powerful purgative effect, render it peculiarly valuable in apoplexy and other cerebral affections. In some persons it produces, even when given in small doses, severe hypercatharsis, which has occasionally proved fatal. It appears to possess a specific action on the intestinal mucous membrane, as, when injected into a vein, it has caused death, and the whole length of the intestines has been found in a state of inflammation. It is more speedy in its operation than any other cathartic, producing copious watery stools in one or two hours, and sometimes in even a shorter period, after its administration. When its action is excessive, a draught of lime- or lemon-juice affords almost immediate relief. Röhrig placed croton oil at the head of his list of hepatic stimulants; but Dr. Rutherford[6] states as the result of his experiments that its effects on the liver are so slight that they are unworthy of attention. Anthelmintic virtues have been also assigned to it. In very large doses it acts as an irritant poison. Externally applied, it is a powerful irritant, producing on the skin an eruption at first papular and subsequently pustular; independent of this, it occasionally produces a peculiar

[1] Lancet, Jan. 31, 1874.
[2] Med. Press, May 12, 1875.
[3] Lancet, Feb. 10, 1877.
[4] Lancet, June 23, 1877.
[5] Med. Times, Aug. 8, 1874.
[6] Practitioner, Nov. 1879.

symmetrical erythema of the face, lasting a few days where no direct application of the oil could be traced. (Dr. Tilbury Fox.) As a counter-irritant it is superior to tartar emetic, on account of the rapidity with which it acts, and in the greater amount of irritation which it occasions. Its external application sometimes produces purging.

883. *Therapeutic Uses. In the obstinate Constipation which accompanies Inflammation of the Brain, Mania, and other Cerebral Affections,* croton oil is especially valuable, acting not only as an aperient, but as a derivative and revulsive. *In Colica Pictonum* it also proves effectual when other remedies fail. *In Apoplexy* it is peculiarly adapted, from the ease with which it may be administered: placed at the back of the tongue, it operates freely.

884. *Tubercular Meningitis.* Dr. R. S. Turner relates some cases of this affection in which croton oil liniment (1 part of croton oil to 3 of olive oil) to the shaven scalp, was productive of the best results. Iodide of potassium was given internally at the same time, but the benefit is attributed by Dr. Turner to the croton oil counter-irritation. He quotes other authorities in favour of the practice.

885. *In Dropsical Affections,* when hydragogue cathartics are indicated, croton oil is sometimes preferable to elaterium, and other remedies of this class; but it is inadmissible when the patient is old and debilitated. Great caution is necessary in its use; it should be commenced in small doses, and gradually increased, according to the amount of purgation which it induces.

886. *In Congestive Dysmenorrhœa, Chronic Congestion of the Uterus, and other painful Affections of that Organ,* Dr. West speaks favourably of a liniment composed of one part of croton oil to ten of camphor liniment, not to be rubbed into the sacrum, but merely applied with a sponge twice a day; this will irritate the skin and afford relief without producing a troublesome eruption.

887. *In Neuralgia, Tic Douloureux, and Sciatica,* Mr. Newbigging found all the distressing symptoms disappear after the internal administration of croton oil. He considers that it possesses a specific power in these nervous diseases, apart from its purgative action. Mr. Hunt also states that in tic douloureux arising from dyspepsia he has derived great benefit from its use.

888. *Chronic Rheumatic and Neuralgic Affections, Paralysis, and Chronic Affections of the Joints,* are often benefited by frictions with croton oil liniment. Should it cause too much irritation, it may be diluted by the addition of soap liniment.

889. *In Phthisis,* croton oil liniment to the chest often affords relief, especially to the distressing *Dyspnœa.* It is also a very useful counter-irritant in *Chronic Bronchitis, Chronic Pneumonia, and other Chronic Lung Affections.* Even in *Acute Bronchitis,* persistent and continuous irritation by the application of croton liniment, more or less over the whole chest, is highly spoken of by Dr. R. Park.[1] He extends its use to the *Bronchitis of Infancy,* and

[1] Practitioner, March 1882.

states that he has used it in scores of cases without once regretting the practice.

890. *For Ringworm* croton oil has been brought forward as a valuable local remedy by Dr. Alder Smith, and there can be little doubt that by setting up a deep-seated follicular inflammation by its means we can reach the seat of the disease and destroy the trichophyton. The difficulty of limiting its operation appears to be the great objection to its use; by its means we may produce a slough, and consequently a permanent bald patch. No one should resort to this remedy without consulting the practical remarks of Dr. R. Liveing in "Brit. Med. Journ.," Feb. 12, 1881, p. 227. His estimate of its value is evidently high, when employed in a proper manner in proper cases. Injudiciously or improperly applied, it will do more harm than good. It has likewise been employed in destroying *Nævi* or *Erectile Tumours*.[1]

891. CUBEBA. Cubebs.

Med. Prop. and Action. Cubebs, in doses of gr. x.–lx., is carminative and stimulant, and improves the tone of the digestive organs. In doses of gr. clxxx.–ʒj. it causes griping and purging, with much febrile action. Some constitutions are peculiarly intolerant of its action; in these it induces nervous excitement, headache, a nettle-like eruption, &c. The rash produced by cubebs, according to Hill and Cooper (p. 513), is more of an orange-red colour and more distinctly papular, each spot being smaller than that produced by copaiba (*q.v.*). It also shows a more decided preference for the trunk of the body rather than for the extremities. It acts specifically upon the genito-urinary organs, and increases the quantity of urine, to which it communicates a peculiar aromatic odour. Its operation is not confined to these organs; it being a stimulant of the mucous surfaces generally. The activity of cubebs has generally been regarded as residing in the volatile oil, of which it contains about 10 per cent., or in its crystallizable principle *Cubebin*, and a peculiar acid—Cubebic Acid. This acid Dr. Reder[2] recommends in gr. xij. doses thrice a day. It can be made into a pill with soap.

892. *Therapeutic Uses.* *In Gonorrhœa*, cubebs is a remedy of established value. The indications for its employment are the same as those detailed for Copaiba (*q.v.*). It should always be used freshly ground. It may be given in electuary: 3 parts of cubebs, 1 of copaiba, 1 of magnesia; for anæmic subjects it may be conjoined with carb. of iron; ʒj. to ʒj. of the carbonate. In some cases it may be given with powdered alum with advantage: ℞ Cubebæ ʒij., Alum. ʒss. M.; divide in pulv. ix.; sumat j. ter in die. The oil of cubebs (gutt. xx.–ij.) may be substituted for the fruit, either alone in mucilage, or in capsules with copaiba and tar, as advised by Sir H. Thompson (5 to 15 a day), or it may be prescribed in solution with T. Ferri and T. Belladonna. Heidenreich tested the value of the oil, the resin and crystallized cubebin, and found the resin alone acted as a diuretic; hence he attributes the curative power of cubebs to the resin alone. The effect of cubebs and copaiba are very similar, but one drug often suits the patient better than the other: cubebs, however, is less irritating; hence it

[1] Med. Press, Dec. 10, 1873. [2] Practitioner, Jan. 1869.

is better borne by dyspeptics. (Hill and Cooper, p. 514.) *In Gleet and Leucorrhœa* it may often be resorted to with advantage.

893. *In Chronic Inflammation of the Bladder*, Sir B. Brodie (p. 111) has known the symptoms to be often much alleviated under the use of cubebs. It must be given only in small doses (gr. x.–xv. thrice daily). When administered largely, it proves injurious. *In Cystirrhœa*, he also found small doses of cubebs very beneficial.

894. *In Chronic Inflammation of the Prostate Gland*, Sir B. Brodie (p. 149) found much benefit from cubebs, in doses of gr. xx. thrice daily. It seems to act as a gentle stimulus to the parts.

895. *In Hœmorrhoids or Piles*, the internal use of cubebs has been found useful in allaying the severity of the symptoms. It forms an efficacious substitute for pepper, and probably acts in the same manner. (See PIPER NIGRUM.)

896. *In Chronic Bronchitis and other Pulmonary Affections of Old Age*, attended with profuse secretion and much debility of constitution, cubebs, in small and oft-repeated doses, has a very beneficial effect in checking the excessive secretion, and giving a gentle stimulus to the system. *In Relaxation of the Larynx*, following a slight cold or over-speaking, the berries chewed are very effectual, according to Dr. H. Wood (p. 516), who also states that in *Coryza* the powdered drug used as snuff has sometimes a beneficial effect. It is only adapted for the advanced stages when the discharge is profuse. Dr. Beverly Robinson[1] strongly recommends cubebs in the *Catarrhal forms of Diphtheria*. He lays great stress on the importance of using the freshly ground berries. The treatment of *Diphtheria* in its early stages by large doses of cubebs has been advocated by M. Trideau and others.[2]

897. CUPRUM. Copper.

A metal which, in its pure state, appears to exercise no sensible effects on the system, but which, in combination with acids, &c., acts as an irritant poison. Food cooked in copper vessels, by dissolving a portion of the metal, and converting it into salts, proves highly poisonous. Only one salt of copper (the sulphate) is officinal in B. Ph. for medicinal use, but solutions of the ammonio-sulphate and acetate are officinal as chemical tests. Pure copper foil is also employed as a test for arsenic, nitrate of silver, and mercury.

898. CUPRI SULPHAS. Sulphate of Copper. Blue-stone. Blue Vitriol.

Med. Prop. and Action. Tonic and astringent. In small doses it produces no sensible effect on the system; but under its continued use, the secretions diminish, the appetite increases, the pulse becomes stronger and fuller, and it acts as a general tonic and astringent. It also acts as a stimulant and tonic on the nervous system. In doses of gr. iij.–iv.–xij. it proves emetic, and without causing much depression of the system. In larger doses it is a powerful irritant poison. Externally it is applied in substance to destroy unhealthy and excessive granulations, and as a styptic to bleeding surfaces. In solution (gr. j.–x. Aq. ℥j.) it is used as a collyrium, wash, &c. Valuable disinfectant properties, especially with reference to typhoid fever, have been ascribed to it, but further evidence is required to establish its virtues in this respect.

Dose:—As a tonic and astringent, gr. ¼–gr. ij.; as an emetic, gr. v.–x.

[1] Amer. Journ. Med. Sci. 1876, p. 30. [2] London Med. Rec. July 1877.

899. *Therapeutic Uses. In Chronic Dysentery and Diarrhœa*, a combination of sulphate of copper and opium proves highly serviceable. Raleigh records cases occurring in India which recovered under the use of the following formula:—℞ Cupri Sulph. gr. $\frac{1}{4}$–$\frac{1}{2}$, Pulv. Opii gr. $\frac{1}{2}$. M. Ft. pulv. ter in die sumenp. I have also seen much benefit from this formula, substituting gr. v. of Dover's powder for the opium advised by Mr. Raleigh. *In the obstinate Diarrhœa of Phthisis*, Sir T. Watson states that it is often effectual in doses of gr. $\frac{1}{4}$, combined with gr. $\frac{1}{4}$ of opium. It occasionally causes griping. *In the Chronic Diarrhœa of Infants*, Dr. Pereira states that he has often employed it with the most excellent effects, in doses of gr. $\frac{1}{12}$. *In the Diarrhœa of Typhoid Fever*, Dr. J. Harley regards sulphate of copper as the most efficacious of all medicines—gr. $\frac{1}{4}$ with Pil. Sapon. Co. gr. ij. every two, three, or four hours; increased, if necessary to gr. j. For children $\frac{1}{8}$–$\frac{1}{6}$ will suffice. If too large a dose be given at first, it may excite vomiting, but in small doses, even when there is considerable irritability of the stomach, it appears to act as a sedative.

900. *In Croup* the sulphate of copper as an emetic has been employed with signal benefit by Hoffmann, Daviot, Crighton,[1] and others. The only drawback to it is its tendency to cause purging and intestinal irritation. Dr. Moir,[2] who regards it as the most reliable of all remedies in croup, directs it to be given in half-grain doses, never in more than one grain, every ten minutes until free and repeated vomiting be produced. Of fifty cases of genuine croup, all children under eight years of age, thus treated by Dr. Crighton, only six proved fatal. *In Diphtheria*, Dr. W. Squire ranks the sulphate of copper, with alum, as one of the best and most effectual of emetics. He directs a solution (gr. v., Aq. ℥j.) to be given in divided doses, a teaspoonful only for young children. The salts of copper have also been advised locally, to check the exudation, but their use is not free from danger.

901. *In Cancrum Oris, Aphthous Ulceration, and Gangrenous Affections of the Mouth*, sulphate of copper (gr. v.) finely powdered, and thoroughly incorporated with ℥ss. of honey, is an excellent application. *For Ulceration of the Gums in sickly, ill-fed children*, Dr. Symonds[3] speaks of the crystalline sulphate as an excellent local remedy; the chlorate of potash, either alone or with cinchona, being given freely internally at the same time.

902. *In Chronic Idiopathic Mania*, when tartar emetic has done its work or is ill-borne, Professor Van der Kolk advises sulphate of copper. Dose, gr. $\frac{1}{5}$, several times daily, in the form of a pill at first, and increased in the same manner as tartar emetic. In one case the dose was gradually increased up to gr. xiij. thrice daily for a month, and recovery ensued. *In Epilepsy*, Dr. Hawkins found it highly serviceable in doses of gr. $\frac{1}{4}$, conjoined with quinia. Dr. Phillips (p. 546) regards it as useful only in epilepsy dependent on intestinal worms, and here he states it has sometimes proved

[1] Edin. Med. Journ. May 1868.
[2] Ibid. March 1879.
[3] Brit. Med. Journ. March 14, 1868.

successful. *In Chorea*, especially when arising from the same cause, Dr. Phillips (p. 546) obtained permanent good results from the sulphate, gr. ¼ thrice daily, gradually increased, if necessary. This treatment, he adds, has been used with marked benefit in *Hysteria* associated with debility.

903. *In Gonorrhœa*, an injection of the following solution has been found useful:—℞ Cupri Sulph. gr. iv.–v., Liq. Plumb. Diacet. ℥ss., Aq. ad ℥iv. M. *In Leucorrhœa*, a solution (gr. xx.–gr. xxx., Aq. Tepid. Oss.) has occasionally been found useful, when thoroughly injected into the vagina, thrice daily. The vagina should be previously washed out with soap and water, (Dewees, p. 75.)

904. *In superficial Hœmorrhage from Leech-bites*, the local application of the sulphate is an effectual styptic. *In Passive and Copious Epistaxis*, a weak solution of the sulphate injected into the nostril, proves serviceable. It is, however, inferior to alum. *In the Intestinal Hœmorrhage of Typhoid Fever*, Dr. J. Harley[1] speaks of the sulphate with soap-pill as a very valuable remedy, and one on which he is inclined to place most reliance. If the patient have been previously taking the copper salt, the dose may at once be increased to gr. j.–ij.

905. *In Purulent Ophthalmia in Infants*, a collyrium composed of Cupri Sulph. gr. j. in Aquæ Camph. ℥j., is occasionally serviceable. *In Granular Conjunctivitis*, the application of the sulphate, in substance, to the inner part of the lids is useful. Mr. E. Nettleship,[2] however, does not regard it as any safer than a ten-grain solution of nitrate of silver, while on the whole it is less efficacious, and not so easy to apply, especially to young children.

906. *Diseases of the Skin. In Tinea Capitis*, Dr. Graves found a solution of the sulphate (gr. x., Aq. ℥j,) a most useful local application. *In Ringworm*, a very effectual remedy is composed of Cupri Sulph. gr. xx., Pulv. Gallæ gr. lx., Aq. ℥j. M. *In Prickly Heat* a lotion of sulphate (gr. x.–xv., Aq. ℥j.) is said often to afford more manifest relief than any other application. *In Ichthyosis*, Sir E. Wilson (p. 383) speaks of the following as a useful application:—℞ Cupri Sulph. gr. x., Ung. Sambuci ℥j. M. To be used twice or thrice daily. *In Molluscum*, Dr. Thompson applied with benefit the sulphate in substance. *To remove Warts*, M. Cazenave employs a strong solution of this salt.

907. *To weak, irritable, and indolent Ulcers*, the local application of a solution of sulphate of copper is attended with excellent effect. In the treatment of the ulcers of the Tenasserim Provinces, which are generally of a peculiarly obstinate character, I met with great success by employing solutions of graduated strengths, from one grain to ten grains in the ounce of water. At the commencement, the weakest solution is applied twice daily; and when this ceases to occasion a feeling of heat in the ulcerated surface, the strength should be gradually increased by single grains, till the ten-grain solution is borne, by which time the ulcer is generally almost

[1] Reynolds' Syst. of Med. vol. i. p. 632. [2] Brit. For. Med.-Chir. Rev. Jan. 1875.

healed. In obstinate cases, these solutions may be alternated with others containing nitrate of silver or sulphate of iron. *To repress Exuberant Granulations*, the sulphate in substance should be employed.

908. *Tape-worm.* Dr. Phillips (p. 547) speaks confidently of the tæniafuge powers of the sulphate of copper given in small and increasing doses in solution every morning, fasting, for eight or ten days, and an occasional dose of castor oil. The commencing dose gr. $\frac{1}{6}$ steadily increased to iij.–v. Should this cause purging or vomiting it is to be discontinued for a time.

909. Cusso. Kousso.

Med. Prop. and Therap. Uses. Anthelmintic. It exercises a poisonous influence on both kinds of *Tape-worm*, and hence is justly regarded as a true tæniacide; but, possessing no cathartic property, a subsequent aperient is required to cause the expulsion of the entozoa. Its disagreeable taste and the large quantity of the drug required, are the great objections to its use. It does not usually produce any physiological effects, but may be followed by some degree of gastric irritation. Dr. H. Wood (p. 614) advises caution in administering it to pregnant women, as it is stated to have produced abortion. Its activity resides in a bitter acrid resinous principle, *Koussine*, which in doses of gr. xl. (divided into two or three portions and given at intervals of an hour) acts efficiently as a tæniafuge, according to Prof. Liedesdorf.[1] It holds the foremost place amongst the anthelmintics of Abyssinia, where tape-worm is the national disease, and from which country it was introduced by Aubert in 1841.

It may be given in the following doses:—Of Cusso for an adult, ʒss; for a child of 7 to 12 years, gr. cl.; from 3 to 7 years, gr. cxx.; for children not exceeding 3, gr. lx.–gr. xc. *Of the Infusion* (Cusso, in coarse powder, ʒss., Boiling Water ʒviij.), ʒiv.–viij., including the infused flowers. It should be taken in the morning on an empty stomach, and followed in three or four hours by a dose of castor-oil, or a mild saline aperient. In some cases in which it has failed to act when given singly, it has subsequently been found effectual when combined with Kamala (*q.v.*).

910. Delphinium Staphisagria, *Linn.* Stavesacre. Louse Wort.

Med. Prop. and Action. The seeds are cathartic, emetic, and anthelmintic in small doses, but are so violent in their operation that they are very seldom given internally. In large doses they are an acro-narcotic poison. When chewed, they cause a great flow of saliva, and have consequently been used as a masticatory. Externally, the bruised seeds have been used to destroy *Pediculi*, for which purpose they are very effectual, though their use is not devoid of danger. Active principle, an amorphous alkaloid, *Delphinia*.

911. *Therapeutic Uses. In Scabies*, stavesacre ointment has obtained some repute, but it is inferior both in efficacy and safety to sulphur (*q.v.*). As a remedy in *Phthiriasis and Prurigo* it possesses considerable power. The best way of preparing the ointment is to digest the bruised seeds (ʒij.) in melted lard (ʒj.), and to strain whilst hot. The objection to this application is that it is apt to irritate delicate skins. Dr. B. Squire[2] found the oil extracted from the seeds by ether, diluted with olive oil, was more efficient than even Ung. Hydrarg. in relieving *Prurigo*.

[1] Wien. Med. Presse, June 1871.

[2] Med. Times, June 6, 1868.

912. *In Neuralgic, Rheumatic and Paralytic Affections*, the alkaloid delphinia, as an external application, is stated by Dr. Turnbull[1] to be very efficient. It may be applied in the form of solution (grs. xl., Spirit. Rect. ℥xii.) or ointment (grs. xxx., olive oil ℥j., lard ℥j.). Care should be taken to avoid applying it to abraded surfaces. It has also been given internally in *Asthmatic and Dropsical Affections*, in doses of gr. $\frac{1}{4}$–$\frac{1}{2}$, but the evidence in its favour is very slight, and great care should be taken in using it, as its action is powerful and uncertain.

913. Digitalinum. Digitalin. The active principle of Digitalis (*q.v.*).

It occurs in two forms: 1. An amorphous whitish or yellowish, odourless, very bitter powder; and 2. Short acicular crystals, of an intense and persistent bitter taste. The former is the article generally met with in commerce; it is thought to be about 100 times stronger than digitalis leaves. It has been employed in *Cardiac, Pulmonary, and Dropsical Affections*, in doses of gr. $\frac{1}{60}$ to gr. $\frac{1}{20}$, by Homolle and Quevenne, Bouchardat, Hervieux, Christison, and others; but there is no evidence of its possessing any superiority over digitalis itself. According to Dr. H. Wood (p. 151), much of the digitalin sold in the shops is inert, and especially is this true of the so-called "digitalin granules." "As this preparation," he judiciously adds, "is complex, variable, and expensive, it ought not to be used; especially as it has no conceivable advantage over the stable preparations of the drug. Even for hypodermic use the tincture seems preferable, as the digitalin solution appears to undergo change in a few hours, and usually when injected causes more irritation than the tincture."

914. Digitalis Folia. Digitalis Leaves. The dried leaves of Digitalis purpurea, *Linn.*

Med. Prop. and Action. Sedative and diuretic, these properties depending upon a peculiar bitter principle, *Digitalin* (*q.v.*). Its physiological effects have been carefully examined by Dr. Brunton,[2] whose statements, much abridged, we follow. In doses so small as to have no poisonous effects, its action is shown first on the urine, and secondly on the circulation. *On the Urine.*—1. In anasarca, especially from heart disease, digitalis acts as a diuretic. 2. It sometimes, but not always, acts as such in health. 3. When it acts upon the intestinal canal, so as to cause vomiting or purging, or when it affects the pulse so much as to cause intermittence, diuresis is much lessened, though a moderate degree of retardation may coexist with diuresis. 4. In large doses it causes suppression of urine, lasting for three days. 5. The acid reaction of the urine remains unaltered, but the urea, chloride of sodium, phosphates, and sulphates, are lessened, and the uric acid increased. *On the Pulse.*—Given in small doses, digitalis first reduces the number of beats without rendering them irregular. If its influence be pushed further, the pulse remains slow, but now and then a quick beat is interpolated. These quick beats, as the influence increases, become more numerous, so that the slow beats become intermissions, and in a still further stage the slow beats entirely disappear, and the pulse becomes regular and extremely rapid. *On the Respiration.*—In large doses, digitalis, as observed in horses, causes first acceleration of the respirations as well as of the pulse; and after this exciting action has passed away the

[1] Med. Prop. of Ranunculaceæ, pp. 114, 118.

[2] On Digitalis, 1868.

number becomes remarkably diminished, deep, broken, and intermittent, the intermittence coinciding with that of the heart. *On the Digestion:* In small doses, digitalis is said to cause increased appetite ; in large doses, it operates as an emetic and cathartic. Before these latter effects appear, however, there is loss of appetite, bad taste in the mouth, nausea, and other symptoms of digestive derangement. When vomiting occurs, it is violent and painful. *On the Nervous System.*—In large doses, in animals, digitalis affects both the sensory and motor system, causing a comatose or semi-comatose state, and insensibility to external impressions, muscular weakness, which causes a stumbling, uncertain gait, and a kind of paralysis of the hind quarters, so that the animal with difficulty draws them after him. In small doses, in man, it produces giddiness, headache (sometimes very persistent), tinnitus aurium, disturbed vision, weariness, languor, and general prostration, and in some cases a kind of intoxication, weakening of the intellectual faculties, and hallucinations and delirium, or even symptoms of acute mania. In some few cases it acts as a soporific. It is apt to cause a remarkable derangement of sight. Dr. Brunton recognized two kinds :—1. A general mistiness of sight, such as is seen before fainting; and 2. A large bright spot, which sometimes resembled a ring showing the prismatic colours faintly, similar to, though less distinct than, that seen round a light after the local application of digitalin. *On the Genital Organs.*—Dr. Brunton agrees with Stadion, that digitalis and digitalin possess the power of temporarily arresting the activity of the sexual organs, and is therefore a true anaphrodisiac. For its influence on the uterus see *infra*, sect. 927. *On the Secretions.*—Salivation has been noticed in some cases ; in others there is occasionally a feeling of dryness of the mouth along with some salivation, but it is not constantly observed. The secretion of the nasal mucous membrane is apt to be increased. Doses a little too large usually induce profuse sweating. In poisoning, hot sweats appear at first, which, as death approaches, dry up and become cold. *The Temperature of the Body* decreases under its use. The cause of death from digitalis seems to be stoppage of the heart's action and defective supply of blood to the nerve centres. (Brunton.) For much interesting information on the action and uses of this drug consult Dr. Milner Fothergill's Prize Essay on Digitalis. (London, 8vo. 1871)—a valuable monograph.

Remarks on the Use of Digitalis. 1. Digitalis in small, long-continued doses is apt to accumulate in the system, and suddenly to induce poisonous and even fatal effects. Dr. M. Fothergill considers that there is no more "accumulation" about digitalis than there is about strychnia or belladonna, &c. If any of these, he observes, be taken into the body in large doses, or more quickly than it can escape out of it, an accumulation must take place.

2. Should, however, either its sedative or diuretic effects be obtained in a kindly manner, the patient, as a general rule, may be considered safe from its poisonous operation. If, on the other hand, neither of these effects be observed in a few days, danger from accumulation may be feared, and it should therefore be discontinued.

3. Perfect rest of mind and body and a recumbent posture favour the development of its action. Patients should be strictly prohibited from taking sudden or active exercise during its administration.

4. It is chiefly applicable to diseases of an asthenic character, and in persons of shattered and debilitated constitutions. In old age its action should be carefully watched.

5. Vomiting or purging interferes with its action both as a sedative and as a diuretic.

5. To obtain its sedative effect, the tincture is the best form of administration; but if its diuretic action be desired, the infusion is preferable, particularly if combined with squill or carbonate of ammonia, or both.

7. In many cases it produces benefit up to a certain point, and then seems to lose all power. In such cases it should be omitted for a few days, or discontinued altogether.

8. Its diuretic action is often induced by its external application.

Dose:—Of Digitalis Leaves powdered gr. ½–1½. *Of the Infusion* (Digitalis Leaves, gr. xxx., Boiling Water ʒx.), ʒij.–iv. *Of the Tincture* (Digitalis Leaves ʒijss., Proof Spirit Oj.), ♏x.–xxx. Exposure to light is thought to impair the activity of digitalis; hence it should be kept in a dark cupboard or wrapped in dark-coloured paper.

915. *Therapeutic Uses. Fevers. In Typhoid Fever* digitalis was first brought prominently to notice by Wunderlich in 1862. Amongst British practitioners who have spoken favourably of it is Dr. Murchison,[1] who observes that whilst it increases the force of cardiac contractions, it diminishes the frequency of the pulse, reduces the temperature, and increases the flow of urine. Dr. Anstie[2] likewise observes that digitalis as a sustainer of exhausted heart-power has apparently proved of the utmost value in many cases of acute febrile disease, running a protracted course, or occurring in subjects whose tissues were damaged by disease or intemperance. Dr. W. Cayley,[3] whilst speaking well of it as a cardiac stimulant in the early stages, observes in the later stages, when the heart has suffered from protracted high temperature, it becomes a dangerous remedy. Dr. Murrell[4] records an instructive fatal case of typhoid fever, to which he appends the following note:—"Practically what we learn from the case is this: that although by means of digitalis we may rescue a patient from the deleterious influence of an excessive rise of temperature, yet that its use is not unattended with danger, and that during its exhibition death may occur suddenly and unexpectedly, without a single note of warning." *In Typhus*, digitalis, according to Dr. Macnaughton Jones,[5] appears to be indicated in the early periods in which we have a rapid pulse and high temperature range, regulating our administration by its effects on both, using it rather with the object of guiding the patient up to a certain point than of curing the disease. *In Scarlet Fever*, Dr. Sidney Fennell[6] states that for years he has employed with the best results a combination of tinct. of digitalis, nitric ether, and nitrate of potash. For infants, one drop of the tincture every three or four hours suffices, though as much as five drops are tolerated. He thinks that it undoubtedly lessens, if it does not destroy, the infectious character of the disease.

916. *In Diseases of the Heart*, digitalis is a potent remedy, but considerable difference of opinion has been expressed as to the cases in which its employment is indicated. The only way of explaining this discrepancy of opinion, as observed in an excellent paper on the subject by Dr. A. Reith,[7] is by allowing to digitalis a double action on the vaso-motor system, such as recent researches render probable is possessed by medicines in general. The truth of the matter, he observes, is this, that in doses large enough to induce reaction digitalis will prove hurtful, if not dangerous, in hyper-

[1] Brit. Med. Journ. Feb. 17, 1872.
[2] Practitioner, Sept. 1873.
[3] Med. Times, April 24, 1880.
[4] Practitioner, Nov. 1875.
[5] Dublin Journ. Med. Sci. April 1878.
[6] Lancet, Jan. 23, 1869.
[7] Edin. Med. Journ. Sept. 1868.

trophy; but in much less quantity, or in stimulating doses, it will be beneficial. The statements of the best observers are in favour of this view. It has been found that the beneficial effects of digitalis in hypertrophy are best obtained from small doses. Trousseau and Pidoux say: "These experiments are, moreover, confirmatory of a fact long since acknowledged—namely, that to exercise its sedative action on the circulation, digitalis must be administered in small doses. Hypertrophy then requires only the primary action of digitalis for its relief, and will be aggravated by any approach to the secondary. But we can suppose a condition of the heart existing where a hypertrophic state would be required to effect a cure, and any drug which would physiologically create hypertrophy would be a proper remedy in the case. Such a condition is found in dilatation, and in enfeebled heart, and such a drug is digitalis when administered in physiological or tonic doses. The experience of every one must confirm this view." Notwithstanding these opinions, modern authorities—Sir William Gull, Drs. Wilks, Fuller, and Handfield Jones—regard digitalis as prejudicial, and even dangerous, in simple hypertrophy, and would restrict its use to cases of dilatation and enfeeblement of the heart. The conclusions drawn respecting it by Dr. W. Murray[1] are as follows:—1. That digitalis will stimulate and strengthen a weak heart, and that the weaker are the muscular tissues of the heart the safer will be the administration of the medicine. 2. That in hypertrophied heart it will fail to reduce the pulse in frequency or strength, and in such cases will prove dangerous. 3. That in a weak organ, acting, because of its weakness, with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. To strengthen and quicken the action of a weak, slowly acting heart, and to reduce the number of the rapid strokes of a feeble heart, is, according to Anstie, to do the work of a true stimulant; bringing action up to the normal standard on the one hand, and reducing it to that level on the other." (Dr. Murray.) Dr. E. Mackey,[2] who has evidently paid great attention to the subject, is of opinion that neither *Mitral Regurgitation* nor *Mitral Obstruction* contra-indicates the use of digitalis, and he details instances in which he prescribes it with advantage; but in *Aortic Regurgitation* and in *Fatty Degeneration*, he regards its employment as either contra-indicated or doubtfully safe. On this point Dr. Waters (p. 349) observes: "Of the value of digitalis in many cases of *Valvular Disease, especially when there is Hypertrophy of the Heart*, there can, I think, be no doubt; but it is not a remedy which should be employed in cases of *Fatty Heart*. If you are even disposed to give it as a diuretic from the failure of other remedies, I advise you to combine it with iron; but I think you ought to abstain from giving it altogether." With regard to the dose in this class of affections, Dr. Mackey considers that in any case where the heart's action is very feeble the commencing

[1] Brit. and For. Med.-Chir. Rev. July 1865.

[2] Brit. Med. Journ. May 30 and July 11, 1868.

dose of the tincture should be ℥v.–x. every four or six hours; in such cases he states that he has seen the dose rapidly increased to ℥xv.–xx., or even ℥xxx., with benefit; but as a general rule, such a dose as ℥xxx. is often enough repeated twice in the twenty-four hours. An equivalent dose is f℥ss. of the fresh infusion, or gr. j. of the powdered leaves; but a patient taking such a dose should be kept recumbent at least half an hour before and for two hours after. He states that he should hesitate before prescribing a larger dose than ℥xv. of the tincture to any patient following his occupation, and he adds that there is no doubt about the fact that half-drachm doses of the tincture, repeated several times at short intervals, especially in the upright position, may produce dangerous interference with the circulation, whether it be from over-stimulus or from a partial paresis. But given as above, no untoward results, as far as cumulative action is concerned, have followed.

917. With reference to the use of digitalis *in Hypertrophy and in Dilatation of the Heart*, the observations of Dr. W. R. Gowers well merit attention: "No remedy," he remarks, "has been discovered which lessens the undue frequency of the heart's action so effectually as digitalis. But digitalis strengthens the cardiac action, and hence its use in hypertrophy has been discountenanced by most modern writers, and by some strongly condemned. Experience, however, is not in complete accord with theoretical conclusions. By many the value of digitalis in hypertrophy is strongly asserted. One explanation of this may lie in the fact that hypertrophy is so rarely simple. Almost invariably dilatation is conjoined with it. In dilatation digitalis is of extreme value, and its use in hypertrophy is, to a great extent, proportioned to the existence and amount of dilatation. Moreover, all irregular action of the heart involves waste of force; too frequent contraction does the same. Each may generally be controlled by digitalis. Even where there is no irregularity and little dilatation, the cardiac action may be below the actual needs of the system; here the additional strength of contraction imparted by digitalis is purely useful. The dose here required is less than in dilatation—*e.g.*, ℥v. of the tincture or f℥j. of the infusion thrice daily. A larger dose is, as Milner Fothergill states, much more frequently deleterious than in dilatation in which large doses are borne not only with impunity but with advantage. In pure hypertrophy digitalis is rarely necessary. (Dr. Gowers.)

918. *In Pericarditis*, after the acute symptoms have been subdued, Dr. Hope found benefit from a combination of T. Digitalis and T. Hyoscyami (āā ℥xv.–xx.). More recently, Dr. Von Niemeyer[2] has strongly recommended digitalis in those cases in which the heart's action is very rapid and feeble, accompanied with cyanotic and dropsical symptoms.

919. *In Palpitations connected with Valvular Disease of the Heart*, Dr. Waters (p. 273) speaks favourably of a combination of

[1] Reynolds' Syst. of Med. iv. p. 727. [2] Practitioner, Sept. 1868.

digitalis and iron, except in very severe cases, when digitalis given alone appears to act best.

920. *Diseases of the Lungs. In Phthisis*, digitalis was formerly held in high repute, and more recently it has been favourably spoken of by Dr. Symonds[1]; but, as a general remedy, it will bear no comparison with cod-liver oil. For the relief, however, of certain symptoms, *e.g.*, *Hæmoptysis*, especially when attended with much vascular excitement, it proves serviceable as an adjunct to other means, but it is not to be relied upon alone. Brunton (p. 4), indeed, regards it as the best remedy for hæmorrhage from cavities in the advanced stages of the disease. As a sedative, the tincture is occasionally of great service as an adjunct to expectorants, especially ammonii carb. in *Chronic Bronchitis* and *Spasmodic Coughs*. *In Pneumonia*, digitalis has been much employed on the Continent by Lissauer, Hirtz, Millet, Oppolzer, Traube, Schneider, and others. Still more recently it has been employed in thirty-five cases by M. Rony-Saucerotte,[2] who regards it as one of the best means of relieving the febrile and other grave symptoms; less active as an antipyretic than veratrum, but more easily managed and less offensive; acting more slowly than leeches, but producing more durable results.

921. *In Angina Pectoris*, Dr. Fothergill (p. 56), acting on the suggestion of Dr. Fuller, gave digitalis in two instances with encouraging results, but he speaks with far greater confidence of its powers in *Cardiac Asthma* or *False Angina Pectoris;* here he looks upon it as "our mainstay." Its employment, however, must in each case be regulated by the extent and character of the cardiac complication.

922. *In Insanity*, where the circulation is active, where there is a tendency to heat of head and congestion of the conjunctiva, and where the patient storms about in a noisy, turbulent manner, is prone to violence, and is sleepless for nights, the tincture in half-drachm doses is more effectual than opium in diminishing excitement, according to Dr. Maudsley,[3] who speaks favourably of it also in mania dependent on organic diseases of the brain, and in that occurring in the course of general paralysis. Here it is often effectual in bringing down the pulse, lessening excitement, and procuring sleep. *In Acute Delirious Mania*, Dr. F. Blandford[4] prefers tinct. of digitalis in the above doses, or henbane, to opiates, which, indeed, in such cases prove prejudicial. It may sometimes be advantageously combined with hydrocyanic acid. Van der Kolk speaks favourably of the action of digitalis, especially in the form of infusion, its use producing greater quietude and more marked depression of pulse-beat than could be obtained by any other means; but these good effects lasted only so long as the medicine was continued; on its discontinuance all the bad symptoms reappeared. He regards it then only as a palliative, though a valuable one.

[1] Brit. Med. Journ. June 13, 1868.
[2] Practitioner, March 1869.
[3] Practitioner, Jan. 1869.
[4] Practitioner, Feb. 1869.

923. *In Delirium Tremens*, the treatment by large doses of tincture of digitalis (f℥ss. till three doses were taken, followed by f℥ij. doses every three or four hours, if required) introduced by Mr. Jones, of Jersey,[1] in 1860, attracted much attention at the time, and several cases were recorded successfully treated by it. Notwithstanding this, its efficacy and safety are alike questionable, and it is now superseded by chloral (*q.v.*), of whose power as well as safety there is no doubt.

924. *In Dropsy and Dropsical Affections*, digitalis has been in common use since its first introduction by Withering,[2] in 1775. Experience has proved it to be a powerful and efficacious remedy, particularly when given in combination with mercury, squills, &c. Dr. Withering observes "that it seldom succeeds in persons of great natural strength, or plethoric habit, or in those with a tight and cordy pulse. If the belly in ascites be tense, hard, and circumscribed, or the limbs in anasarca solid and resisting, we have but little hope. On the contrary, if the pulse be feeble and intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, the anasarcous limbs pitting under pressure of the finger, we may expect the diuretic effects to follow in a kindly manner." Experience has fully proved the general justice of Withering's remarks; at the same time, it must be observed that digitalis has failed more frequently than his eulogiums would lead us to expect. Its efficacy is much increased by combination; and if the infusion, which is the best form for administration in this class of cases, be employed, it may be advantageously combined with carb. of ammonium or tinct. of perchloride of iron. The following pill has long enjoyed a merited reputation in dropsy:—℞ Pulv. Digital. gr. ss., Pulv. Scillæ gr. iss., Pil. Hydrarg. gr. ij. M. A pill to be taken three times a day. Dr. Murchison advises these pills to be conjoined with the use of a mixture containing acetate or bitartrate of potash, nitric ether, and decoction of broom tops. This advice of Dr. Murchison has reference to dropsy arising in connection with hepatic disease, but it is equally applicable to cardiac dropsy. *In Hydrothorax*, Dr. Anstie (Syst. iii. p. 953) found no diuretic yield better results than the following draught:—℞ Infus. Digitalis ℥ss., Potassii Acid. Tart. grs. xxx. M. Repeated twice or thrice daily. Trials with it should precede the use of cathartics. *In Dropsy after Scarlet Fever*, Sir H. Holland[3] particularly advised a combination of digitalis and tinct. of perchloride of iron; and there is no doubt that in this and many other forms of dropsy attended with anæmia it is a very eligible formula. In prescribing digitalis in dropsy arising from heart disease, attention should be paid to the remarks in sect. 916. In these cases we should not lose sight of the fact, now established by the observations of Dr. Christison and others, that diuresis may sometimes be induced by the external application of digitalis to the abdomen, either by fomentation with an infusion about four times the usual

[1] Med. Times, Sept. 29, 1860.
[2] On Digitalis, 1775.
[3] Med. Notes and Reflect. p. 546.

strength, or by frictions with an embrocation containing equal parts of tinct. of digitalis and soap liniment. Or it may be applied in the form of poultice, as advised in the next section.

925. *In Suppression of Urine*, the effects of digitalis applied in the form of poultice to the abdomen, according to the observations of Mr. J. D. Brown,[1] in six instances which he details, are often very remarkable. When procurable, he employs the fresh leaves; but in the winter, or when not available, he adds ʒj. of the tincture to a warm linseed-meal poultice. The dried leaves made into a poultice with ʒss. of the tincture also succeeded. He considers that the leaves collected before seeding time have the most power, the winter leaves the least. Only two effects were observable—a marked reduction in the pulse-beats and great diuresis. This treatment seems worthy of further trial. *For re-establishing the Renal Secretion in Cholera*, Dr. E. Goodeve recommends the following:—℞ T. Digitalis ♏v.–x., Sp. Ether. Nit. ♏xxx., Liq. Ammon. Acet. ♏lx., Aq. ʒj. M. ft. haust. 3tis horis sumend. Plentiful diluents are also advisable.

926. *In Piles*, digitalis given internally proved highly serviceable in the hands of Dr. E. Mackey. He relates some very severe cases of hæmorrhoids in which the tincture, ♏x.–xv. every three hours, exercised a marked influence in relieving the turgescence and all the more painful symptoms.

927. *In Uterine Affections characterized by undue excitement*, digitalis, from its sedative action on the generative organs, appears to be worthy of a trial. In *Menorrhagia* and other forms of *Uterine Hæmorrhage* unconnected with organic disease, digitalis appears to exercise a remarkable and decided sedative action. Dr. West (p. 63) testifies to its value in those cases, especially in that form of *apparently causeless hæmorrhage which occurs in women towards the time of the cessation of the menses;* he prescribes ʒiv. of the infusion every four hours (ʒij. in very feeble cases), discontinuing it at once if it cause faintness or dizziness. Should no benefit follow its use in forty-eight hours, it should be discontinued. He also furnishes the following formula:—℞ Potass. Nit. ʒj., Tinct. Digitalis ♏xl., Syrup. ʒiv., Aq. ʒvss. M. Coch. amp. ij. 4tis hor. sumend. During its use the patient should be confined to the horizontal position in bed in a cool room, and have a mild stimulant diet.

928. *In Spermatorrhœa*, few remedies are of more avail than digitalis in ʒj.–ʒij. of the infusion twice or thrice daily. The free application of cold water to the testes and perinæum aids the effect of the medicine. (Ringer, p. 483.)

929. *In Epilepsy*, digitalis in large doses (ʒij.–iv. of the tincture) has been strongly advocated by Dr. Sharkey and others, but it is certainly less safe, and probably far less efficacious, than the bromide of potassium (*q.v.*).

930. *In Sciatica and other Neuralgic Affections*, Dr. Fuller (p. 426) speaks of digitalis (powdered leaves gr. j.–jss., or tincture

[1] Med. Times, Jan. 25, 1868.

mx.–xx., three or four times a day) as a reliable remedy when the pain is intermittent and of a purely neuralgic character; in other forms of the disease it is useless. Sedative and diuretic in its action, it calms the vascular system, excites an increased flow of urine, and thus, though not exercising a narcotic influence, it frequently allays pain and affords repose. (Dr. Fuller.) *In Hemicrania*, it proved successful in the hands of Debout and Serre[1]; but, as they both employed it in combination with quinine, it is doubtful how far the benefit derived was due to the digitalis. *In Earache*, Dr. Lehman,[2] after the exhibition of a mild purgative, advises, as an effectual remedy, the introduction into the meatus of a piece of cotton saturated with the tincture of digitalis.

931. *In Aconite Poisoning*, the researches of Dr. M. Fothergill (p. 6) have led to the employment of digitalis as a physiological antidote. A case successfully treated by the subcutaneous injection of the tincture (mxx.) together with the application of galvanism to the cardiac region is recorded by Mr. Dobie, of Keighley.

Diosma crenata. See Buchu Folia.

932. Duboisia Myoporoides.

A Solanaceous plant of N. S. Wales and Queensland, introduced into this country by Mr. John Tweedy, who, with Dr. Ringer, made it the subject of an elaborate report in the *Lancet*, March 2 and April 20, 1878. It yields an alkaloid, Duboisine, which, in the words of Dr. Ringer, "possesses the same properties as atropia, but is far more powerful in its action on man. It dilates the pupil and paralyzes the muscles of accommodation. It checks perspiration, and dries the throat. It produces delirium, headache, great weakness, and sometimes a rash similar to that of belladonna. The alkaloid is so powerful, that a 1 in 120 solution applied to the eyes often excites great giddiness, weakness, and a 'drunken feel.'" (Ringer, p. 550.) As a mydriatic it is apparently identical with atropia; if there be any difference, it is that duboisia is the more prompt and energetic of the two. It promises to be a valuable agent in ophthalmic medicine and surgery. As a local application, the commencing strength of one grain to an ounce of water may be used. A four-grain solution has been found to produce toxic symptoms. Much caution is required in its use. A sulphate of duboisine is included by Mr. Martindale in his Extra Ph. (p. 107).

933. *Therapeutic Uses. Externally. In Ophthalmic Surgery*, duboisia is used as a mydriatic. It is more powerful than atropine. Unpleasant effects have, in a few cases, followed its use.

934. *Internally. Sweating of Phthisis.* Gubler[3] uses gr. $\frac{1}{33}$ hypodermically. He employs this remedy also in *Acute Mania*.

935. Elaterium.

Med. Prop. and Action. Hydragogue cathartic. The best mode of administering it is in divided doses of gr. $\frac{1}{3}$ every four hours, until it begins to operate. It often occasions severe griping, vomiting, or hypercatharsis, but this may be partially obviated by combining it with a small portion of powdered capsicum or ginger. It gives rise to considerable dryness of the mouth and fauces, a desire for drinks, and, after its operation, to a great feeling of depres-

[1] Sydenham Soc. Year Book, 1861.
[2] Amer. Journ. of Med. Sci. v. p. 34.
[3] Rev. des Scien. Méd. Jan. 1880.

sion and debility, which soon passes off. The stools produced by elaterium resemble water in which meat has been partially boiled. It is only suited for dropsical or cerebral affections, where a powerful revulsive action is desired; in cases of ordinary constipation it should never be employed. It contains an active crystalline principle, *Elaterine*, which forms from 20 to 30 per cent. of good elaterium. This may be given in doses of gr. $\frac{1}{24}$–gr. $\frac{1}{6}$. Both elaterium and its active principle are irritant poisons in large doses, causing gastro-intestinal inflammation. One great objection to its use is the uncertainty of its operation. Not only is it largely adulterated, but it loses much of its efficacy by long keeping. When pure, it should be in light, friable, slightly incurved cakes, about one line thick, greenish-grey, acrid and bitter, with a finely granular fracture; not effervescing with acids, and yielding half its weight in boiling rectified spirit. In order to obviate the uncertainty of its operation, it has been advised to substitute the active principle, and Dr. Christison furnishes the following formula for its administration:—℞ Elaterin. gr. j., Spt. Rect. f℥j., Nitric Acid ♏iv. M. Dose, ♏xxx.–xl.

The active principle, Elaterinum, is introduced into the B. Ph. 1885, and ordered in doses of gr. $\frac{1}{40}$-$\frac{1}{10}$.

936. *Therapeutic Uses. In Dropsical Affections* generally, elaterium is one of the most efficient hydragogue cathartics we possess, but, as its action is exhausting and depressing, it is adapted mainly for sthenic cases and the early stages of the disease; given injudiciously to the old, or to those debilitated by age or long illness, it may do more harm than good. The dose should be carefully regulated, so as to avoid hypercatharsis, and during its operation the strength may be supported by a little stimulant, and nutriment—*e.g.*, beef-tea. In *Dropsy connected with Heart Disease*, Dr. Hyde Salter, speaks highly of the value of purgatives, and prescribes elaterium in doses of gr. $\frac{1}{6}$ on alternate mornings about five A.M., so that its operation is over by ten or eleven A.M. This treatment, he says, quiets the heart, relieves the dyspnœa, lessens pulmonary congestion, and thus diminishes the effusion. *In Hydrothoraæ*, Dr. Anstie (Syst. iii. p. 953) regards elaterium as incomparably superior to all other hydragogue cathartics. After diuretics have been fairly tried, elaterium may be boldly resorted to in doses of gr. $\frac{1}{4}$, with a little hyoscyamus, every four hours. Usually two or three doses suffice to produce a very copious watery catharsis. A little stimulant should be given when the bowels act, and the effect is thus very far from exhaustive. "The rapidity with which the fluid diminishes in the chest, and the consequent relief to all the patient's sensations, in favourable cases, must be seen to be believed." (Anstie.) *In Dropsical Effusions attendant on Bright's Disease*, no hydragogue, according to Dr. W. Roberts (Syst. v. p. 526), is superior to elaterium, when the serous accumulation is very threatening, and immediate effects are demanded. Dose, gr. $\frac{1}{6}$–$\frac{1}{4}$ every three or four hours until free evacuations are obtained. On the use of this and other drastics, Dr. Roberts makes an observation which it would be well always to bear in mind:—"Exhausting diarrhœa sometimes occurs spontaneously in the later periods of Bright's disease, and the use of drastics has been known to originate this untoward symptom; their use should, therefore, be immediately desisted from if the diarrhœa shows signs of proving intractable."

937. *In Cerebral Affections*, elaterium, as a powerful cathartic, occasionally proves highly serviceable, not only in removing the obstinate constipation so frequently attendant on these affections, but as a revulsive and derivative. It is, however, less applicable in the majority of cases than croton oil, or the stronger saline purgatives. It should be avoided in the aged, or in those much debilitated.

938. Emetina. Emetia. Emetine. A feeble alkaloid. The active principle of Ipecacuanha (*q.v.*).

939. *Therapeutic Uses*, the same as those of Ipecacuanha.

940. Ergota. Ergot.

Med. Prop. and Action. Valuable oxytocic and hæmostatic. In small or single doses (grs. xx.–xxx.), the effects of ergot on a healthy male adult are not very obvious beyond causing dryness of the throat and fauces, thirst, and occasionally pain in the abdomen. Its peculiar action on the gravid uterus, specially during labours, will be noticed subsequently. Taken in large and long-continued doses, it induces two distinct states: 1, called gangrenous ergotism, attended by loss of muscular power, great debility, and gangrene of the extremities; and 2, convulsive ergotism, in which the cerebro-spinal system is prominently implicated. Ergot is a very complex substance: in addition to an inert fixed oil (35 per cent.) and a peculiar ammoniacal base (*Propylamia* or *Trimethylamin ?*) it contains two non-crystallizable alkaloids, *Ecbolina* and *Ergotina* (Winckler), one crystallizable, *Ergotinine* (Tanret), and three acids, *Ergotic*, *Phosphoric* and *Sclerotinic*. In which of these the activity of ergot resides is a moot point; but, as it is pretty well agreed that the watery extract contains all the active ingredients, it may be used as the nearest approach to the active principle at our command. (Wood, p. 554.) With regard to sclerotinic acid, Dr. Wood observes that it does not seem probable that it will prove of practical value, as was anticipated by Stumpf and others.

Dr. R. Kobert,[1] of Strassburg, has quite recently described the active principles which occur in ergot. They are Ergotinic acid, Sphacelinic acid, and Cornutin.

Ergotinic acid is the active principle of Bonjean's extract, as also of the sclerotinic acid of Dragendorff and Podwyssotzki. Its action, when injected into the blood or subcutaneously, is to paralyze the cord, then the brain and sympathetic system. As a result, dilatation of the vessels occurs with lowering of blood pressure. Neither contraction of the uterus nor gangrene of the extremities follows its use. When swallowed, tingling of the tips of the toes occurs, but 90 per cent. is destroyed by the digestive juices.

Sphacelinic acid rapidly induces gangrene. It causes contraction of the arterioles, and thrombosis, which is due to hyaline contraction of the vascular wall. The uterus contracts, being thrown into tetanus.

Cornutin in toxic doses causes spastic contraction of the muscles with subsequent degeneration. There is also fibrillar atrophy. The uterus is thrown into clonic convulsion. Convulsive ergotism is probably due to cornutin. Dr. Kobert concludes that preparations of ergot which contain sphacelinic acid and cornutin are alone of therapeutic value.

The modus operandi of ergot has been much disputed, but it appears certain that it possesses the power of acting upon and exciting contraction of involuntary or unstriped muscular fibre. The uterus, especially in the gravid state, is the principal example of this variety of muscular fibre, and it is on this that its effects are most marked and best known; but we have it also existing in the bladder, the gullet and stomach, the intestinal canal, the bronchial tubes,

[1] Practitioner, Dec. 1884.

the ducts of many glands, the iris, and, what is perhaps still more important, the middle coat of arteries; we have also in the heart a great involuntary muscle, though its fibres are not of the unstriped variety. Dr. A. Meadows considers it probable that ergot affects the muscular fibre found in every one of these structures in a greater or less degree, though it certainly does not affect them all equally, either in the same or in different persons. It is to the action thus exercised on the muscular coat of the capillaries that is doubtless due the astringent power that ergot displays in cases of hæmorrhage, and the same fact explains in a measure its power as an emmenagogue.

"Bonjean's Ergotine" is simply a purified aqueous extract of ergot, and, being perfectly soluble in water, is well adapted for hypodermic medication. It is believed to be about ten or twelve times as strong as ergot, grs. v.–vj.=3j. of the crude drug. For subcutaneous injection dissolve grs. xij. in Aq. Dest. 3j. and inject ♏v.–x. as required. Dr. H. Wood regards Dr. Keating's solution as a preferable form—℞ Ergotinæ grs. xlv., Glycerini, Aq. Dest. āā ♏cv. M. Of this, gutt. xx.–xxx. may be used at once. It is stated that the danger of local trouble, which is one of the great drawbacks to its use, may be lessened by plunging the nozzle of the syringe deeply into the muscular tissue (p. 567). The dose of Bonjean's Ergotine, internally, is from 1 to 3 grains in the form of pill, and from 2 to 4 grains hypodermically. Kept covered in a porcelain pot, ergotine will keep good for any length of time, but kept in solution it soon loses its activity and becomes inert. (Dr. Cleaver.[1]) The taste of the liquid extract is said to be effectually disguised by beef tea.

As an Agent for inducing Abortion, or Premature Labour, the power of ergot has been variously estimated, but the evidence adduced by Ramsbotham, Merriman and others is conclusive as to its power for this purpose, though not as to its safety, at any rate as far as the fœtus is concerned. On this point Playfair (ii. p. 144) observes: "The risk to the child is quite as great as when the membranes are punctured, for not only is it subject to injurious pressure from the contractions which the ergot produces, but the drug itself when given in large doses seems to exert a poisonous influence on the fœtus. For these reasons," he adds, "ergot may properly be excluded from the available means of inducing labour." Dr. H. Wood (p. 562) on this point observes that ergot is uncertain in its action, and offers no advantages over instrumental methods.

941. *Therapeutic Uses. As an Expulsive Agent in Labours.* The concurrent testimony of obstetricians for nearly three-quarters of a century has established beyond a doubt the powers of ergot as an oxytocic, and the very knowledge of its powers in this character has led, it is feared, to its abuse, so that it has, from its indiscriminate and reckless employment, fallen somewhat from the position it formerly held in medical opinion. The following passage, slightly abridged from Dr. W. S. Playfair's valuable work on Midwifery (ii. p. 9), may be taken as fairly representing the views entertained of this agent at the present day:—"Ergot has long been the favourite remedy for deficient uterine action, and it is undoubtedly a very powerful stimulant of the uterine fibres. It has, however, very serious disadvantages, which have been recognized by the ablest practitioners, and it is very questionable whether the risks to both mother and child do not more than counterbalance any advantages attending its use. The ergot is given in doses of grs. xv.–xx. of the freshly powdered drug infused in warm water, or in the form of liquid extract in doses of ♏xx.–xxx. In about fifteen minutes after its administration the pain generally increases greatly in force

[1] Liverpool and Manchester Med. Surg. Rep. 1875, p. 13.

and frequency, and if the head be low in the pelvis, and if the soft parts offer no resistance, the labour may be rapidly terminated." "Were its use always followed by this effect, there would be little or no objection to it. The pains, however, are different from those of natural labour, being more strong, persistent, and constant. Its effect, indeed, is to produce that very state of tonic and persistent uterine contraction which is one of the chief dangers of protracted labours. Hence, if from any cause the exhibition of the ergot be *not* followed by rapid delivery, a condition is produced which is serious to the mother and extremely perilous to the child, on account of the tonic contraction of the muscular fibres obstructing the utero-placental circulation. Dr. Hardy found that soon the fœtal pulse fell to 100, and that, if delivery were long delayed, it commenced to intermit, and when this occurred he found the child was always born dead. He found, also, that the number of still-born children in cases where ergot has been employed was very large. Nor is its use by any means free from serious danger to the mother; a not inconsiderable number of cases of rupture of the uterus have been attributed to its incautious use. Hence, if it is to be given at all, it must be with strict limitations, and after careful consideration. The cardinal point to remember is, that ergot is absolutely contra-indicated unless the absence of all obstacles to rapid delivery has been ascertained. Hence it is only allowable when the first stage is over, and the os fully dilated, when the experience of former labours has proved the pelvis to be of ample size, and when the perinæum is soft and dilatable. Perhaps, as has been suggested, the administration of small doses—*e.g.*, ℥v.–x. of the liquid extract—every ten minutes until more energetic action sets in, might obviate some of these risks."

942. *The circumstances under which it proves useful, and those in which it is inadmissible*, have also been judiciously set forth by Dr. Churchill. *Ergot may be safely given*:—1. When the pains are feeble and inefficient without especial cause. 2. If the os uteri be soft and dilatable. 3. If there be no obstacle to a natural delivery. 4. If the head or breach present, and be sufficiently advanced. 5. If there be no head symptoms, or excessive general debility. *Ergot should not be given*:—1. If the os uteri be hard and rigid. 2. If the presentation be beyond reach. 3. If there be mal-presentation. 4. If the pelvis be deformed. 5. If there be any serious obstacle to delivery in the soft parts. 6. If there be head symptoms or much general irritation.

943. The period at which it is generally the most advantageous to administer ergot is when the head of the child has passed the brim of the pelvis; but its use is by no means confined to this period. Dr. Meigs advises that it should be given only at the moment of, or just before, the birth of the child, in order to secure, if possible, a permanent and good contraction of the womb after labour in women who are known in their preceding labours to have been subject to alarming hæmorrhage. Dr. Playfair (i. p. 340) speaks favourably of the practice of giving a full dose of the ergot,

℥j. or more of the liquid extract, after the completion of the labour. He states that he has long been in the habit of administering it at this period, and believes it of great value, not only as a *prophylactic against hæmorrhage*, but as a means of *lessening after-pains*.

944. If, notwithstanding this preventive treatment, *Post-partum Hæmorrhage* (vulgo *Flooding*) sets in, ergot is still powerful for good, but in order to obtain its speedy effect, which in these cases is all-important, it requires to be used hypodermically. Two grains of Bonjean's Ergotine in solution, injected deep into the tissues of the arm or elsewhere, soon manifests its operation. In a case recorded by Mr. S. Grose,[1] "within five minutes the womb had firmly contracted, and the danger had passed." Others have testified to its value when thus employed. It should not be used to the exclusion of firm pressure on the uterus, compression of the abdominal aorta, the plug, and, if necessary, intra-uterine injections, all valuable accessories in their way. *In Secondary Uterine Hæmorrhage*, Dr. Playfair (ii. p. 118) states that the liquid extract in ℥j. doses, every six hours, is very generally useful; in more chronic cases, where the bleeding is of an atonic or passive character, he recommends a mixture of ergot, sulphate of iron, and small doses of sulphate of magnesia.

945. *In Menorrhagia*, ergot, according to Dr. Matthews Duncan,[2] stands first as a remedy, but in cases occurring in unimpregnated women its action is comparatively tardy. You must not, he observes, expect it to act thoroughly till days of its use have elapsed: in some cases no result was obtained until it had been continued for weeks. Dr. West (p. 64) regards it as specially serviceable in those forms of menorrhagia which *occur after abortion*, or in cases where there is imperfect involution of the uterus, or where, as in some delicate women, there is a deficiency of the contractile power in that organ, he advises the liquid extract in ℥j. doses every four hours, either alone or with small doses of tinct. cannabis if there is much uterine pain.

946. *In Fibroid Tumours of the Uterus*, the hypodermic injection of ergotine exercises a marked influence in arresting their growth—no drug more so, according to Dr. A. Russell Simpson,[3] who testifies strongly in its favour. Others have employed it with manifest advantage, amongst them Dr. Atthill,[4] who, however, substitutes for ergotine the liquid extract (B. Ph.), ♏xv.–xx. of which, with equal parts of water, he injects to the depth of an inch into the gluteal muscle. By this means he considers the sores, &c., which so commonly follow the subcutaneous injection of ergotine are avoided. Under the use of ergot thus administered, the tumours diminish in size and attendant hæmorrhage is arrested. These remarks apply equally to *Polypoid Growths*. *In Cancer of the Uterus*, Dr. Aust-Lawrence[5] has often seen marked relief of pain

[1] Lancet, ii. 1877.
[2] Med. Times and Gaz. ii. 1883.
[3] Edin. Med. Journ. Jan. 1878.
[4] Brit. Med. Journ. Sept. 2, 1876.
[5] Med. Times, March 24, 1877.

from full doses of ergot, ℥xxx. of the liquid extract every six hours. *In Chronic Ovaritis*, Mr. Lawson Tait[1] observes:—"The treatment should consist mainly of organic and systemic rest, as perfect as possible, during the menstrual periods, and the administration of ergot. Between times, counter-irritation may be used." (See Iodine.) In these cases, ergot may often be advantageously combined with the ergot.

947. *In Puerperal Fever*, Dr. Matthews Duncan,[2] in addition to local antiseptic measures (see Carbolic Acid), advocates the administration of ergot—℥j. of the liquid extract in divided doses daily for a few days. The object is to induce permanent contraction of the uterus; this diminishes the uterine cavity in which the discharge accumulates; it thus also lessens the surface absorbing the putrid poison; and the contraction of the walls of the organ may to some extent prevent the passage of the fetid fluid along the vessels into the circulation. If it be desirable, he adds, to give the agent hypodermically, ergotine may be substituted for the liquid extract.

948. *In Sub-involution of the Uterus, in Chronic Sub-acute Metritis, and in Uterine Hypertrophy*, Dr. Meadows has employed ergot with good results. In all these cases it acts beneficially; first, by lessening the vascularity of the organ, which it effects by diminishing the calibre of the blood-vessels; and, secondly, by inducing a state of tonic contraction of the uterus itself: it seems, indeed, to be essentially a uterine tonic, improving the general nutrition of the organ, and imparting a firmer and more healthy tone.

949. *In Leucorrhœa and Chlorosis*, it is sometimes very useful. Dr. Churchill employed it (gr. v. three or four times daily) with decided benefit; a blister to the sacrum appears to increase its efficacy. Dr. Graily Hewitt (p. 399) states that he has used it in cases of leucorrhœa when the uterus was in a lax, congested condition, with the double effect of relieving profuse menstruation and the leucorrhœa sometimes associated with it. In these cases it may be advantageously combined with the salts of iron. The same has occasionally been found useful in *Amenorrhœa* dependent on an atonic or relaxed condition of the uterine muscular fibres. *In the Constipation of Chlorotic Girls*, where this was apparently due to atony of muscular fibre, Dr. Meadows found a combination of ergot and steel very effectual.

950. *In Diabetes*, ergot has been successfully employed by Dr. Da Costa,[3] in doses of ℥j. of the fluid extract (U.S. Ph.), gradually increased to ℥ij. thrice daily. The cure was accomplished in about two months, and was permanent. Another successful case is recorded by Dr. J. W. Hunt.[4] It is thought to be more adapted for diabetes insipidus than the mellitus; still in the latter it seems worthy of further trials, either alone or as an adjunct to other remedies.

[1] Brit. Med. Journ. June 6, 1874.
[2] Lancet, Nov. 6, 1880.
[3] Trans. Coll. Phys. of Philadelphia, 1875.
[4] Practitioner, Sept. 1880.

951. *In Incontinence of Urine from simple want of power in the muscular coat of the bladder, from general atony, from chronic catarrhal inflammation, or in cases of reflex Paralysis of the Bladder*, Dr. Meadows obtained good results from small and often repeated doses of ergot and tincture of steel. *Retention of Urine*, under the same circumstances, is likely to be benefited by this combination. Dr. Meadows considers that in ergot, combined with buchu, uva ursi, pareira brava, and triticum repens, we have a most valuable adjuvant in a variety of cases of *Bladder Disease*. He specially recommends a trial of it in those cases of *frequent Micturition accompanying Disease of the Uterus* in cases of anteflexion, or in fibroids of the anterior wall, in both of which pressure is made on the lower part of the bladder, with a resulting loss of power. He thinks that it should be extensively employed in such cases. *In the Nocturnal Enuresis so frequent in Dementia*, Van der Kolk (p. 149) states that he has used the extract with the best result. He likewise found it effectual in *Incontinence of Urine in Children*. *In Chronic Irritability of the Bladder*, Dr. Tilt (p. 312) states that he has seen great benefit from ergot in doses of grs. v. every three or four hours.

952. *Hæmorrhages*. Amongst constitutional hæmostatics ergot ranks first, and it does so in virtue of its power of causing contraction of the muscular coat of the blood-vessels, and thereby arresting the flow of blood. Of its use in Menorrhagia and Uterine Hæmorrhage we have already spoken. That it exercises considerable power when given internally is shown by the cases of *Hæmoptysis* recorded by Dr. Anstie,[1] which yielded to the liquid extract in forty-five grain doses every four hours; but the concurrent testimony of more recent authorities proves that, for efficacy and rapidity of operation, the hypodermic injection of ergotine is far superior. The cases of *Hæmoptysis, Hæmatemesis, Hæmaturia, Intestinal Hæmorrhage, Epistaxis, Bleeding Piles*, &c., cured by this means on record are too numerous for individual mention, but they are sufficient to settle beyond a doubt the efficacy of the treatment. *In Hæmorrhage from the Bowels in Typhoid Fever*, Dr. Grimshaw[2] pronounces ergot "the most useful remedy." Dr. Little[3] obtained satisfactory results in these cases from the hypodermic injection of grs. v. of ergotine; and the practice has the recommendation of Sir W. Jenner[4] when the loss of blood is sudden and copious, or is frequently repeated—an ice-bag being at the same time applied over the ileum.

953. *In Cerebral Hæmorrhage (sanguineous or true Apoplexy)*, Dr. Althaus,[5] from personal experience, recommends the subcutaneous injection into the cellular tissue of ergotine gr. j. every hour, or in severe cases every half-hour. Dr. N. S. Foster[6] relates two cases successfully treated by this mode. He employed ℥xij. of a ten-grain solution, which he injected deeply into the muscles. He

[1] Practitioner, Feb. and April 1873.
[2] Dublin Journ. Med. Sci. Feb. 7, 1877.
[3] Dublin Journ. Med. Sci. May 1872.
[4] Lancet, Nov. 15, 1880.
[5] Brit. Med. Journ. July 22, 1876.
[6] Lancet, Sept. 21, 1878.

justly remarks that a great deal depends in these cases upon the promptitude of its administration before much hæmorrhage has taken place. No mode of treatment holds out a better prospect of success; it is well worthy of a trial in every case. Dr. R. F. Dickenson[1] states that in several cases of *Heat Apoplexy* at Calcutta he employed with manifest advantage the liquid extract (℥xv. with T. Aconiti ℥iij.) every hour. N.B.—An observation of Dr. R. Bowles[2] may here be introduced—it well merits being borne in mind: it is that the stertorous (pharyngeal) breathing so distressing in apoplexy may be relieved by simply placing the patient on his side instead of his back.

954. *In Diarrhœa,* ergot has been successfully employed by Dr. Wright and others. In one case he found grs. v. thrice daily effect a marked improvement when dysenteric symptoms were coming on. In an epidemic of *Dysentery* at Bielau, Dr. Gros[3] used ergotine with excellent results, grs. xij.–xv. in enema with some bland vehicle; or grs. vj. by the stomach in emulsion. One of the effects especially noted was that it quickly reduced the quantity of blood in the stools. *In Prolapsus of the Rectum,* ergotine injections have been used with benefit.

955. *Diseases of the Heart.* Dr. Meadows considers it certain that ergot exercises an influence upon the heart, and that, though its action may be somewhat uncertain, it seems likely to be of service in cases of enfeebled cardiac action, when there is either degeneration of tissue, or when the walls of the heart are thin and flabby. Dr. Waring-Curran mentions two cases of *Fatty Degeneration of the Heart,* in which occasional doses of ergot appear to have been of material use.

956. *In Aneurism,* the subcutaneous injection of ergotine was proposed in 1869 by Van Langenbeck,[4] on the ground that, as ergot induced contraction of the smooth muscular fibres, it would probably prove a powerful agent in producing hæmostasis. Two cases of aneurism, one in the right supra-clavicular fossa, and the other of the right radial artery, were successfully treated by this means. Dr. Dutoit, of Bern, and others, have successfully repeated this treatment. (Dr. Ritchie, *loc. cit.*) Several cases of *Varices,* some very large, successfully treated with the subcutaneous injection of ergotine, are recorded by Dr. P. Vogt,[5] of Greifswald.

957. *Mental Diseases.* Dr. Crichton Browne,[6] after extensive clinical observation, pronounces ergot eminently useful in certain varieties of *Recurrent Mania, in Chronic Mania with lucid intervals,* and in *Epileptic Mania.* In these forms of cerebral derangement, he found it almost uniformly efficacious in reducing excitement, in shortening attacks, in widening the intervals between them, occasionally in altogether preventing their occurrence, and in preventing that perilous exhaustion by which excitement is so often succeeded.

[1] Brit. Med. Journ. Oct. 1878.
[2] Brit. Med. Journ. May 28, 1881.
[3] Practitioner, Nov. 1868.
[4] Berliner Klin. Wochenschrift, 1869, No. 12, p. 117.
[5] Brit. Med. Journ. April 27, 1872.
[6] Practitioner, June 1871.

The doses required are very large—ʒj.–ʒij. of the tincture (B. Ph.), ʒss.–ʒj. of the liquid extract, grs. v.–x. of ergotine. No evil effects were observed to follow from such doses, even when long continued —none more serious, at any rate, than transient headache, indistinctness of vision and formication, and anæsthesia of the hands and feet.

958. *In Chronic Congestion or Inflammation of the Spinal Cord and its Meninges*, Brown-Séquard obtained excellent results from ergot, and he recommends it in all cases where it is desired to diminish the amount of blood present in the spinal cord or its membranes. (Dr. Meadows.) In some forms of *Paralysis*, probably those arising from spinal congestion, it has also been found useful. Dr. Meadows mentions a case of *Paraplegia complicated with menstrual irregularity*, in which a cure was effected by its means. Dr. Waring-Curran has found occasional doses of ergot successful in the *Constipation of the Paralytic*, when the most powerful cathartics had failed.

959. *In Ptosis and Paralysis of the Eyelids*, an aqueous infusion, as a collyrium, is advised by M. Carron; and a case is related in which paralysis of the eyelids from partial asphyxia following the respiration of charcoal fumes was cured in eight days by fomentations with an aqueous infusion of ergot.[1] *In Abnormal Dilatation of the Pupil*, from any cause, its local application is suggested by Dr. Comperat,[2] he having observed that the powder of ergot, used as snuff, has the power of removing the dilatation of the pupil produced by belladonna. *In a disturbed state of the accommodation power of the Eye*, specially induced by overtaxing the organ on small objects with an insufficient amount of light, Prof. Willebrand found ergot of especial advantage. He also found it of great use in several cases of *Acute and Chronic Inflammation of the Eye*, and especially in *Blepharitis* and *Pustular Conjunctivitis of Children*, the cure proving much more rapid, and relapse much rarer, than when local means alone are relied on. He prescribes grs. v. thrice daily, combining it with magnesia, or, when chlorosis is present, with iron.

960. *Neuralgia. In one case of severe Neuralgia following Shingles, in one of Sciatica of four months' duration, in one of Hemicrania*, and in *two of ordinary Tic Douloureux*, Dr. E. Woakes[3] effected a cure in the course of from four to six days by the administration of ergot. He employed it first on theoretical grounds. Further cases are required to establish its true value in this class of diseases.

961. *In Hooping Cough*, Dr. Hampel[4] states that he has derived great benefit from ergotine. The efficacy of the liquid extract is also attested by Dr. Dewar,[5] who prescribes it in doses of ♏iv.–xv. every three or four hours to children of three months and upwards; its beneficial operation is soon apparent. He likewise advocates

[1] Med.-Chir. Rev. lx. p. 613.
[2] Med. Times, xviii. 1848.
[3] Brit. Med. Journ. Aug. 8, 1868.
[4] Brit. Med. Journ. Sept. 5, 1863.
[5] Practitioner, May 1882, p. 356.

its use in *Nasal Catarrh*, which he says may be cut short by a fresh dose of ergot, if taken at the outset of the attack. It has also been employed successfully with other remedies, however, in *Pneumonia* by Dr. Wells, of New York.[1]

962. *In Enlargement of the Spleen connected with Intermittent Fever*, Willebrand (*op. cit.*) found ergot effectual, even when large doses of quinia had failed.

963. *In Skin Diseases.* Dr. Shoemaker[2] obtained excellent results from the oil of ergot prepared by subjecting ergot to benzine, and afterwards allowing the benzine to evaporate, the result being a reddish-brown acrid fixed oil soluble both in alcoholic and alkaline solutions; with this he successfully treated the acute variety of *Eczema*, especially that of the lips, *Herpes genitalium*, *Acne rosacea*, *Erysipelas*, *Cracked Nipples*, &c. With regard to its use in *Erysipelas*, Willebrand (*op. cit.*) had already pointed out the benefit to be derived from cataplasms of bruised ergot, and Dr. Millican[3] had successfully employed in an epidemic of facial erysipelas a solution of ergotine (1 in 50). Its application was followed by marked and speedy improvement. Cases of *Purpura Hæmorrhagica* treated by ergotine hypodermically are recorded by Dr. W. L. Lane[4] and Dr. L. D. Bulkley.[5]

964. A case of large and long-standing *Bronchocele* greatly benefited by the hypodermic injection of ergotine is recorded by Dr. Sinclair Coghill.[6] The influence of this treatment in other *Tumours* is worthy of attention. *In impending Milk Abscess* ergot may prove useful given internally, the observations of Dr. Le Gendre[7] tending to show that it possesses powers as a lactifuge.

965. *In the Night-sweats of Phthisis*, and other diseases, Dr. Christmann obtained good effects from ergot in doses of ʒij.–ʒiij. daily. Dr. H. Wood (p. 563), who cites this, observes that this is what might *a priori* have been expected, as these sweats are due to relaxation of the capillaries, which ergot effectually controls.

966. Erythrophlœum Guinense, *Don*, a leguminous tree of Guinea, the bark of which constitutes the Casca, Sassy or Ordeal Bark of W. Africa. It is powerfully poisonous, and contains an alkaloid, *Erythrophleine*, the properties of which have been examined by MM. Sée and Bochefontaine. (See *Lancet*, July 3, 1880.)

Med. Prop. and Action. Cardiac sedative, thought closely to resemble digitalis in operation on the heart. Dr. Brunton, in his Gulstonian Lectures for 1877, published the results of his elaborate experiments as to its physiological action. In kind, this action seems much to resemble digitalis. "Hitherto," Dr. Brunton remarks, "digitalis has been our great resort in mitral disease, but it is probable that in casca we possess a drug more powerful still—at least its effects upon the arterioles appears to be greater, and it is quite possible that it may succeed in those cases of advanced mitral disease where digitalis fails." Dr. E. Sansom,[8] who quotes this passage, states that he had employed the tincture of casca

[1] Dublin Journ. Med. Sci. June 1882, p. 553.
[2] Practitioner, Aug. 1881.
[3] Brit. Med. Journ. Dec. 10, 1881.
[4] Brit. Med. Journ. Sept. 5, 1874.
[5] Practitioner, Nov. 1876.
[6] Lancet, Aug. 4, 1877.
[7] Bull. de Thérap. lxxvii. p. 282.
[8] Med. Press, Feb. 7, 1883.

substitutively for digitalis in a considerable number of cases, but has never been able to convince himself that it has any more beneficial action in mitral disease. Still, it is evidently a potent remedy, and may prove worthy of further attention. Dose of the tincture (1 to 10 of rectified spirit), ♏v.–x.

967. *Therapeutic Uses. In Mitral Disease*, casca is, according to Dr. Brunton,[1] of great value, being useful in much the same class of cases in which digitalis is indicated. Dr. Sansom[2] has employed casca in *Mitral Disease*, but has never been able to satisfy himself that it exercised a more beneficial effect than does digitalis. Sée also speaks slightingly of this drug in mitral valvular disease.

968. *In Cardiac Diseases* other than *Mitral*, Dr. Brunton (*op. cit.*) cautions against the use of casca in aortic disease, basing his assertions upon pathological reasoning. Casca, although probably of service in some forms of mitral disease, should nevertheless be given with care, as it is liable to upset the stomach, and thus aggravate the tendency to dyspepsia so common in mitral stenosis.

969. *In Cardiac Asthma*, according to Sée, casca acts very beneficially, its action being to render the heart's action more slow and ample.

970. *In other Diseases*, Drs. Weir Mitchell and Hammond, who brought forward an elaborate review of the action and uses of casca in 1859, attributed to it astringency, and believed it acted as a cholagogue and diaphoretic. It is said to have effected cures in *Periodic Fevers, Colic, Diarrhœa, Dysentery.* (Stillé and Maisch.)

971. *In Hœmorrhage* due to *Flaccidity of the Capillaries*, casca is reputed to be of singular benefit; for, as Brunton has pointed out, casca causes contraction of the small arteries.

972. Erythroxylon Coca. Cocaine. Cucaine.

Med. Prop. and Action. The leaves contain a yellowish-white bitter alkaloid, *Cocaine*, which crystallizes in monoclinic prisms. It was first isolated by Niemann or Godeke as early as 1859. In 1862 Lossen discovered a second principle, which was called hygrin. Besides these other principles, occur ergonine, coco-tannin and a wax-like body. Cocaine is soluble in water (1 in 704), alcohol, chloroform, ether, oil of cloves, vaseline, and castor oil (1 in 20). It acts as a base and forms salt with the acids; thus there are known the hydrochlorate, the salt in common use, the salicylate, citrate, sulphate, nitrate, tannate, and oxalate. Although the active principle was not isolated before the time of Niemann, yet the powerful effects of the leaves of the coca were described as far back as 1837, when Tschudi[3] narrated how the natives of Peru and Chili were in the habit of chewing it. Under its influence they defied hunger, and accomplished feats of endurance when required. The dose of the salts of cocaine is placed between the wide limits of gr. $\frac{1}{32}$ and gr. iss., but very much larger doses have been taken, and have been unaccompanied by any untoward result.

Locally, as an anæsthetic, its strength varies from 1 in 5 to 1 in 25 according to the depth and extent of the skin or mucous membrane to be anæsthetized. It may be painted over the surface or injected hypodermically. It should be remembered that cocaine denudes the mucous surface of epithelium. Mr. Hurry Fenwick draws attention to a peculiar fungus which makes its appearance in stale solutions of cocaine. This fungus sets up considerable inflammation when allowed to come into contact with mucous membranes.

1 Gulstonian Lectures, 1877.
2 Brit. Med. Journ. Jan. 1883.
3 Quoted Practitioner, Jan. 1835.

The physiological action has been carefully worked out by Dr. Hughes Bennett[1] and more recently by Dr. Von Anrep.[2] Their results may be briefly narrated. In small doses, cerebral excitement, with partial anæsthesia; in toxic doses, absolute anæsthesia, tetanic convulsions and death. The posterior columns of the cord and the sensory nerves are paralyzed, the motor tract being unaffected. Respirations, at first slowed, are finally stopped. The heart's contractions are lessened in force and frequency. There is initial contraction, subsequent dilatation of the capillaries, stasis supervening. The temperature, after a slight initial fall, rises. Mydriasis occurs. There is increased secretion from mucous surfaces. Tenesmus accompanies the increased alvine flux. The revival of the use of the alkaloid was due to Herr Koller, who, through Dr. Brettauer, introduced its anæsthetic properties to the notice of the Ophthalmological Congress at Heidelberg, September 1884. His results have been more than fully confirmed by subsequent observers.

The action of cocaine upon the eye is described by Mr. Jessop (*op. cit.*). He found that the power of accommodation was lost, and the loss persisted for three-quarters of an hour. The pupils dilated, but reacted alike to light and (at first) to accommodation. Complete anæsthesia of the cornea and conjunctivæ appeared in fifteen minutes. The anæsthesia was limited to the conjunctival margin of the lids; pulling the eyelashes caused pain. There was a sensation of heaviness and cold to the eyeball; slight lacrimation; enlargement of the palpebral fissure. Constriction of small peripheral fissure. Faradic reaction of cocainized muscle (orbic. palp.) increased.

Officinal Preparations and Doses of Coca in leaf ʒss.-ij. Extractum Cocæ Liq. ʒss.-ij., Cocainæ Hydrochloras gr. $\frac{1}{5}$-j., also in the form of Lamellæ or gelatine doses each containing Cocaine gr. $\frac{1}{200}$.

973. *Therapeutic Uses. Externally. In Ophthalmic Surgery.* Most of the minor operations upon the eye have been performed painlessly under cocaine. In some cases the patients expressed themselves wholly anæsthetic, in others they were partially so. Mr. Bader has operated for cataract, done iridectomies, squint operations, &c., on cocainized eyes, and expresses himself satisfied. Mr. Jessop has also performed many of the eye operations, using cocaine, and in most of his cases a successful anæsthesia was obtained. He cautions that, as cocaine renders the cornea flaccid, it makes extraction of foreign bodies somewhat more difficult. Similar testimony is borne by Mr. Anderson Critchett, Mr. Juler, and others.

974. *Operations and Affections of the Larynx.* Dr. Felix Semon[3] and Dr. Prosser James[4] speak in favour of a 20 per cent. solution in operations about the larynx. Mr. Butlin has also found it highly serviceable.

975. *Operations about the Nose.* Dr. Semon has obtained anæsthesia in operations for cauterizing, removal of polypi, &c. These results are confirmed from America,[5] where Dr. Bosworth has used it in cases of nasal catarrh and hay fever. He uses a two per cent. solution.

976. *In Uterine Surgery.* The minor operations have, it is said, been carried out without inflicting pain after three or four times painting the mucous membrane with cocaine. Dr. Protheroe Smith

[1] Ed. Med. Journ. xix. 323.
[2] See Mr. Jessop's Paper in Practitioner, Jan. 1885.
[3] Lancet, Nov. 1884.
[4] Brit. Med. Journ. Nov. 1884.
[5] See N. Y. Med. Rec. Nov. 1884.

has found cocaine very serviceable when it was necessary to make *Vaginal Examinations* in cases in which *Hyperæsthesia of the Genital Canal* exists.

977. *In Dental Surgery.* The Hydrochlorate of Cocaine has been employed for two purposes, as *an obtunder to sensitive dentine, as an anæsthetic during extraction.* It seems to fail in the latter case, although when used of a strength of 20 per cent. it lessens pain in some cases. It has been applied either in the form of a paint by means of repeated employment of a camel's hair brush, or by injecting a 4 per cent. into the tissue of the adjacent gum with a hypodermic syringe. In the former method it is important to thoroughly dry the gum before painting on the cocaine. Recently the oleate of cocaine, 4 or 5 per cent. has been employed in dentistry, and it is by some authorities preferred to the Hydrochlorate or Citrate.

978. *Operations about the Urethra.* Injections of cocaine into the urethra are said to render it anæsthetic,[1] even to cutting operations. Several observers state that *Strictures of the Urethra* have been dilated and even divided after injections of cocaine, without much pain having been felt. Lithotrity has also been several times performed when cocaine alone was used as an anæsthetic.

979. *Opening Abscesses, &c.*, can be made less painful by cocainizing the skin.[2]

980. *Internally*, cocaine has been used on the Continent in similar ways to caffeine (*q.v.*); at present it has received little or no attention in England.

981. It is said to be antagonistic to morphine, and is spoken highly of in the treatment of morphinism, the dose of cocaine being increased as that of the morphine is lessened.

982. *In Melancholia* and *Insomnia*, and in *Atonic Stomach Affections*, cocaine has been tried with some success. Ploss[3] commends it as a powerful narcotic, and compares its action in that respect to Cannabis Indica, for, he remarks, the sleep is preceded by an extreme activity of the brain.

983. *In Sciatica and Lumbago*, hypodermic injections of cocaine often remove the pain immediately.

984. *In Neuralgia*, whether of the fifth or other nerve, this alkaloid will frequently evince marked analgesic power.

ESERINE. See PHYSOSTIGMA.

985. ETHER. Æther. ÆTHER SULPHURICUS. Sulphuric Ether.

Med. Prop. and Action. Diffusible stimulant and anti-spasmodic taken internally. The vapour is powerfully anæsthetic. The application of its anæsthetic properties to surgery was first made in 1846 by Morton, of Boston, U.S., and to him is due the honour of having introduced the practice of anæsthesia in surgical operations—the greatest improvement in modern surgery. The subject of ether narcosis has been investigated by Dr. Anstie, who draws

[1] L. Med. Rec. art. 3422.
[2] Cocaine, Dr. Murrell, L. Med. Rec. Dec. 1884.
[3] Zeitschr. Chir. ccxxii. 1862.

the following conclusions:—1. In the production of ether narcosis important differences may be noted in the order of the symptoms, according to the rapidity with which the blood receives the higher degrees of saturation. 2. In ether narcosis induced by the inhalation of an atmosphere *weakly* impregnated with the vapour, the narcotic effects consist of a paralysis which spreads from periphery to centre, which involves the brain, the sensory, the motor, and the sympathetic system to nearly an equal extent; the sympathetic phenomena probably appearing slightly the earliest, and the sensory affection slightly preceding the motor. 3. The same results are produced by the injection of a moderate dose of liquid ether into the peritoneal cavity, or into the interior of the digestive canal, unless it should be eliminated by the lung so rapidly as not to reach the arterial system in any considerable quantity. 4. In either case, if the process do not extend over too long a period, it tends naturally to recovery. The too great prolongation, however, even of this, tends to produce death by paralyzing the respiratory movement through its effects on the medulla oblongata. 5. In very rapid saturation of the blood with a large dose of sulphuric ether, the course of narcosis is materially disturbed, and tends to the immediate production of dangerous and even fatal symptoms, which differ from those observed when an animal gradually sinks into death by apnœa, as the result of the protracted operation of smaller doses. 6. The statement of Dr. Snow and others, that ether is altogether incapable of causing sudden death by paralysis of the heart, is considerably invalidated by the result of several experiments with strong atmospheres. 7. The statement that circulation and respiration are affected in direct proportion to each other, and that both these functions are rendered more active in the earlier, and depressed in the later, stages of etherization is inaccurate, for it not unfrequently happens that the circulation is greatly quickened, while the respiration remains almost at its normal frequency, or slightly accelerated. It was frequently noted in the experiments, that great rapidity of circulation was not the uncertain harbinger of a rapid and shock-like fall of the pulse-rate, but in all these cases it was obvious that the rapidity as well as the subsequent slowness were the direct consequence of a paralysis of those portions of the nervous system which regulate the heart's action. 8. That this excessive rapidity of circulation is due to partial paralysis of the sympathetic system is supported by the occurrence of certain symptoms, particularly, α, flushing of the face, attended usually by perceptible perspiration. β, a more or less copious secretion of saliva. γ, the abnormal formation of sugar by the liver, leading to artificial diabetes. This last symptom is apparently far more readily produced when ether is introduced into the system by injection than by inhalation. For fuller details consult Dr. Anstie's work, "Stimulants and Narcotics," which will well repay perusal. The advantages and disadvantages of ether, specially in reference to chloroform, are thus set forth (slightly abridged) by Dr. J. W. Browne[1]:—*Advantages.*—It is said that all records show it to be safer than chloroform (this, he says, is a matter of opinion; it is, however, undoubtedly a matter of fact). Its greatest advantage is that, though like chloroform it may kill by arresting respiration, it does not do so by its depressing action on the heart—*i.e.*, it does not kill by cardiac syncope. *Disadvantages.*—It is an unpleasant anæsthetic; it increases the flow of saliva during administration, which occasionally gives trouble, and its taste and odour are persistent to the patient's senses even for days after it has been taken. There is also danger of ether vapour catching fire should any light be incautiously placed near the patient's mouth during inhalation. (See also Chloroform.) The disadvantages, however, as set forth by Dr. J. W. Browne are practically all overcome by careful administration when an inhaler is used. The relative merits of the various anæsthetic agents cannot be entered into here. In hot climates ether cannot of course be used, but in temperate climates it is safer when given with Clover's inhaler, and more speedy than chloroform. It is contra-indicated in very young children, in elderly persons with rigid arteries, and in emphysematous or bronchitic subjects. At all times its use needs care and special experience.

[1] Dublin Journ. Med. Sci. May 1881.

Mr. Hervelston[1] calls attention to the relative value of ether prepared respectively with "rectified" and methylated spirits of wine, and gives his verdict decidedly in favour of the latter. Indeed, he regards methylated ether as the safest anæsthetic known, when administered by means of Clover's inhaler. His observations, however, are not in accord with our experience. It appears probable, from the experiments of Claude Bernard, that ether exercises a marked influence on the pancreatic secretion, which under its use may be, augmented to almost any degree: he was accustomed to give ether to animals, in order to obtain a good flow of pancreatic juice. (Dr. Foster.[2]) From the power which ether possesses of dissolving cholesterine, as well as on account of its anti-spasmodic properties, it has been recommended as an internal remedy in *Jaundice depending on the presence of gall stones.* It may prove worthy of further notice. Attention has recently been called to the value of ether, inhaled in minute quantities, as a stimulant-sedative in old age.[3] Applied externally, it evaporates rapidly, producing a marked sensation of cold and anæsthesia. "Ether spray," applied the whole length of the spine (Jaccoud's plan) was tried by Dr. Anstie[4] in *Chorea* with great advantages in several instances, and Dr. Handsel-Griffiths[5] mentions two cases of *Post-partum Hæmorrhage* in which ether spray, directed over the abdominal walls, along the spine and over the genitals, was followed by immediate contraction of the uterus, and consequent arrest of the hæmorrhage.

986. *Therapeutic Uses.* See Chloroform.

987. ÆTHERIS vel ETHERIS NITROSI SPIRITUS. Spirit of Nitrous Ether. Sweet Spirit of Nitre.

Med. Prop. and Action. Refrigerant, diuretic, and diaphoretic. It is chiefly used as an adjunct to other remedies of the same class. According to Nunneley[6] there occurs under its use a slight increase of urinary water, and a decided diminution of urea and solids. To obtain its diaphoretic and refrigerant effects, it is best combined with liquor ammoniæ acetatis; to obtain its diuretic action, with squills, &c.

Dose:—mxxx.–℥ij.

988. *Therapeutic Uses. In mild Febrile Affections, Catarrhs, Coryza, and Influenza, to relieve Nausea and Flatulence,* and in some forms of *Dysuria,* sweet spirit of nitre, in doses of ℥j.–iss. in a cupful of any convenient vehicle, is a popular and efficacious remedy. *In Dropsy,* it is a valuable adjunct to other diuretics, particularly to acetate of potash, squills and digitalis.

989. ÆTHERIS SPIRITUS. Spirit of Ether. Spirit of Sulphuric Ether. A combination of Sulphuric Ether and Rectified Spirit.

ÆTHERIS SPIRITUS COMPOSITUS. A combination of Ether f℥viij., Rectified Spirit f℥xvj., and Ethereal Oil f℥iij. Hoffmann's Anodyne.

Med. Prop. and Action. Diffusible stimulant, and anti-spasmodic. They are best given in combination with other remedies.

Dose:—Of Spirit of Ether, mxxx.–f℥iss.; *of the compound Spirit,* mxxx.–f℥ij.

[1] Lancet, July 1, 1882.
[2] Brit. Med. Journ. Aug. 8, 1868.
[3] Practitioner, Dec. 1869.
[4] Practitioner, June 1874.
[5] Practitioner, March 1877.
[6] Med.-Chir. Trans. liii. p. 36.

990. *Therapeutic Uses.* *In Asthma*, spirit of ether is favourably mentioned as a palliative by many writers, but Dr. Hyde Salter denies its efficacy.

991. *In Cardiac Neuralgia, including every variety of Angina Pectoris*, Dr. Anstie speaks of ether in doses of ℥xl.–lx. as useful as a palliative, but inferior to arsenic or strychnia (*q.v.*). He recommends it also in *Uterine and Ovarian Neuralgia, and in Neuralgic Dysmenorrhœa.* For the relief of *Dysmenorrhœa*, Dr. Graily Hewitt (p. 443) considers the compound spirit as the best form of ether for the purpose, and he advises its use, combined with camphor, henbane, sal-volatile, &c., when the pain is not very severe. Dr. West (p. 82) also states that it is often of much service in ʒss. doses.

992. *In Spasmodic Affections of the Bowels, Flatulence*, and *Flatulent Colic*, it may be administered with the best effects. It is particularly serviceable when these occur in hysterical females.

993. *In Cholera*, it has been extensively employed as a stimulant in the stage of collapse. In some cases, it seems to have roused the sinking vital powers. It requires to be given in large doses, with other stimulants.

994. *In Typhus and other low Fevers*, it is often productive of excellent effects, particularly when nausea, subsultus tendinum, and other spasmodic symptoms are present.

995. *In Earache*, exposing the ear to the fumes of ether is often attended with great relief. It may be effected by mixing equal parts of the spirit and hot water in a phial, and applying its aperture to the external ear. In some instances it affords temporary relief, by acting as a solvent of accumulated cerumen in the meatus.

996. *Hiccough* is often immediately arrested by ℥xx.–xxx. of the spirit of ether in some aromatic water.

997. ETHIDENE. Dichloride of Ethidene. A colourless volatile liquid, possessing the odour and taste of chloroform. It is said to be identical with chloride of ethylidene, which is obtained as a bye-product in the manufacture of chloral, or may be made by the action of pentachloride of phosphorus on aldehyde. Sp. gr. about 1·2; boiling point 135° to 150° F. Miscible in all proportions with pure ether, alcohol, and chloroform; soluble in about 300 parts of water. (Martindale.)

Med. Prop. and Action. Anæsthetic: as such it was employed in 1858 by Dr. Snow in fifteen cases with satisfactory results; but it attracted little attention till the publication of the Report of the Glasgow Committee on Anæsthetics in 1879. From this it appears (1) that both chloroform and ethidene administered to animals have a decided effect in reducing the blood-pressure, while ether has no appreciable effect of the kind. 2. But chloroform reduces the pressure much more rapidly and to a greater extent than ethidene. 3. That chloroform has sometimes an unexpected effect on the heart's action, the pressure being reduced with great rapidity almost to *nil*, while the pulsations are greatly retarded, or even stopped. 4. That ethidene reduces the blood-pressure by regular gradations, and not, so far as has been observed, by sudden and unexpected depressions. . . . . Ethidene, the Report goes on to say, has been given to a large number of patients of all ages with satisfactory results.

Given freely, at first it produces anæsthesia as rapidly as chloroform, and the effect could be readily kept up by comparatively small doses. The only drawback is that in some cases it produced vomiting; but it has not been determined that it does so more frequently than chloroform, over which it has the further advantage of producing less excitement, and being more agreeable to the patients. *In fine:* ethidene has proved itself as efficient an anæsthetic as chloroform, and a much safer one. "It is not asserted that this agent ought at once to replace chloroform in practice, but it is believed that a very strong case has been made out for an extensive trial of it."[1] Mr. Clover[2] administered it in 1,872 instances, of which 287 were major operations, and his report is on the whole satisfactory; but he observes, "Unfortunately it sometimes depresses the heart's action. I have been seriously alarmed by this, and have been obliged on three occasions to lower the patient's head, and induce artificial respiration." His report concludes with a case of cardiac syncope, occurring under ethidene inhalation, which proved fatal. Two deaths have since been reported, but one was doubtfully due to the ethidene. Mr. Bird finds ethidene dichloride a satisfactory anæsthetic for children. Ethidene is not included in the British Pharmacopœia of 1885.

998. ETHYL IODIDUM. Iodide of Ethyl. Hydriodic Ether.

Discovered in 1815 by Gay-Lussac, it was first prepared in an accessible form by Serullas in 1827, and was studied by Nunneley in 1849.

Med. Prop. and Action. Iodide of ethyl is prepared by distilling phosphorus, iodine and alcohol together. It is colourless, non-inflammable, and possesses a powerful, pungent, unpleasant odour. It is soluble in ether and alcohol, less so in water. Nunneley found inhalations killed various animals subjected to their influence; but more recent researches tend to show that in small doses the vapour possesses marked power in allaying laryngeal spasm, dyspnœa and asthma. Its *modus operandi* cannot be said to be well understood; it seems clear, however, that the iodine which so rapidly becomes disengaged from the compound can hardly be accredited with all the antispasmodic power this preparation undoubtedly possesses. (Stillé and Maisch.)

The best mode of administration is in glass capsules wrapped in cotton wool; each capsule contains ℥v. and is snapped between the finger and thumb at the moment of use, and then held to the patient's nostrils.

999. *Therapeutic Uses. In Asthmatic Seizures*, whether *True Asthma* or the *Dyspnœa of Phthisis*, &c., the inhalations of this iodide is, according to Sée,[3] of pre-eminent service.

1000. *In Laryngitis*, especially the chronic disease, in *Nervous Dyspnœa*, and in *Cardiac Breathlessness*, it is also of use. *In Œdematous Laryngitis*[4] and *Œdema Glottidis* ethyl iodide also proves serviceable. Inhalations in Sée's case were repeated twelve times, with the result that a complete cure of the œdema occurred.

1001. *In Chronic Bronchitis*, iodide of ethyl is valuable. It increases secretion and allays spasm. Dr. Lawrence[5] thinks very highly of it. In all forms of chronic affections of the bronchial mucous membranes, he drops several minims upon a handkerchief, and allows the patient to inhale it.

1002. *In Syphiloma of the Brain* and *Cord*, and in all cases when it is desirable to get the system rapidly under the influence

[1] Brit. Med. Journ. June 21, 1879.
[2] Brit. Med. Journ. May 29, 1880.
[3] Practitioner, xxi. 446.
[4] Centralblt. f. die med. Wissensch. 1879, May. Med. Times and Gaz. 1878.
[5] New York Med. Rec. June 1880.

of iodine, the iodide of ethyl is, according to Bartholow, of great service.

1003. The same authority extols the use of this preparation in *Whooping Cough* and *Emphysema*.

1004. Eucalyptus Globulus, *Labill.* Blue Gum Tree.

A myrtaceous tree of Australasia, largely cultivated in various parts of India, Africa, and S. Europe, chiefly in low malarious localities, on account of its alleged power of rendering such sites healthy. This it effects by its wonderful property of absorbing moisture from the soil: its roots ramify very superficially and in every direction, and thus perform a sort of surface drainage. It grows with great rapidity, and is supposed to absorb about ten times its own weight of water in twenty-four hours: at the same time, it diffuses through the surrounding atmosphere camphoraceous (antiseptic ?) emanations. Various examples of its success in Algeria are recorded. At Pandook, on the banks of the river Hamyza, fever was extremely prevalent in 1867: thousands of eucalypti were planted, with the immediate effect of rendering the locality healthy. A similar result has been obtained at Gué, near Constantine, in Corsica, Ceylon, Cape of Good Hope, &c. (Dr. C. A. Gordon.)

Med. Prop. and Action. Stimulant, anti-spasmodic, anti-periodic and antiseptic. The leaves and their volatile oil are the only parts employed in medicine. The preparations included in the B.P. 1885 are Oleum Eucalypti, and an ointment, Ol. Eucalypti 1 part, Paraff., hard and soft, āā 2 parts.

1005. *Therapeutic Uses. Externally. In Antiseptic Surgery*, eucalyptus oil, gauze soaked in eucalyptus oil, and a eucalyptus spray are used. The power possessed by eucalyptus of dissolving iodoform is also made use of, and an ointment composed of eucalyptus oil, iodoform, and vaseline (Iodof. ʒj., Eucalyp. Ol. ʒj., Vaseline, Paraff. āā ʒiiss.) is a very valuable antiseptic application. Eucalyptus oil is pleasant of odour and non-irritating, and is antiseptic, being, it is said, more powerfully so than carbolic acid.

1006. *Internally. Ague.* The Continental authorities differ in their verdict upon the value of this drug in the *Intermittents*. Dr. Curnow[1] records his experience, which is favourable towards eucalyptus in treatment of *Ague*. He gave ʒj. to ʒij. of a tincture. Dr. Roberts[2] does not obtain much benefit; although many of his cases improved, some were unaffected.

1007. In cases of *Bronchitis, Bronchorrhœa*, and *Digestive troubles*, accompanied by *foul vomiting*, Mr. Benj. Bell[3] finds eucalyptus in tincture very useful.

1008. *Fœtid Discharges* from *Nose, Uterus, &c.*, are alleviated, or at least covered, by eucalyptus applications.

1009. *In Parturition.* In effecting antiseptic midwifery, eucalyptus oil is very valuable. Pessaries and bougies are readily made and impregnated with it, or iodoform may also be added.

[1] Lancet, Sept. 2, 1876.
[2] Practitioner, 1878.
[3] Edin. Med. Journ. 1878.

1010. *In Diphtheria*, &c. Inhalations (Ol. Eucalypt., Spir. Rect. āā, using 3j. or less, are useful alike in *Diphtheria, Tonsillitis, Pulmonary Gangrene*, and *Septic Sore Throat.*

1011. *Phthisis.* Dr. Saundby[1] recommends tow impregnated with eucalyptus oil to be used in an inhaler.

1011*. *Gonorrhœa.* Mr. Watson Cheyne, regarding the urethritis as due to a specific organism, has recommended bougies made of theobromine impregnated with iodoform and eucalyptus.

1012. Euonymin. A neutral principle obtained from the bark of Euonymus atropurpureus, Wahoo, Spindle Tree, or Burning Bush.

Med. Prop. and Action. It is reputed to be tonic, anti-periodic, hydragogue and diuretic. Euonymin is uncrystallized, is soluble in ether (?), alcohol, and water, possesses an intensely bitter taste. The real value of euonymin[2] lies in its action upon the liver, whereby the secretion of bile is increased, while, at the same time, it promotes catharsis.

1013. *Therapeutic Uses. In Torpidity of the Liver*, and all conditions in which the secretion of bile is in abeyance, or lessened, euonymin proves serviceable. Dr. Rutherford found active purgation followed its administration, and, at all events, in dogs a marked cholagogue effect was promoted. He regards it "as of great value."

1014. *In Sick Headache*, when dependent upon *Derangement of the Liver*, euonymin is said to prove of the greatest service. Mr. Hardyman, of Cardiff,[3] used it in gr. ij. doses at bedtime, in fifty cases, and found marked benefit. Dr. Rutherford recommends euonymin in gr. ij. doses, coupled with ext. hyoscyamus, followed in the morning by an aperient water, *e g.*, Pullna, or Carlsbad.

1015. Fel Bovinum Purificatum. Purified Ox Bile.

Med. Prop. and Action. Taken internally, it produces no marked physiological effect; it is not purgative, but it acts simply as a solvent of materials contained in the stomach and intestinal canal, producing no excitement to propel, but, by liquefying the mass, facilitates its excretion. It is best administered about three hours after meals, and care should be taken to see that it is good; if it has a green tinge it is unfit for use. Diuretic and anthelmintic virtues have also been ascribed to it, but these are doubtful.

Dose:—Grs. v.–x., in pill or in capsules.

1016. *Therapeutic Uses. In Dyspepsia and Constipation*, attended by torpor of the liver, when the stools indicate deficiency of the biliary secretion, ox-gall, by supplying the deficiency, may prove useful as a palliative. It may be given as follows:—℞ Fel Bov. Purif. 3ij., Ol. Carui, ♏x., Magnes. Carb. q.s. M. Ft. pil. xxxvj. and use two pills a day. *In Jaundice with obstruction*, to supply the place of bile in the digestive process, inspissated ox-gall should be given in doses of grs. vj.–x., about three hours after each chief meal: it will then reach the duodenum about the time that the chyme has passed the pylorus, and thus perform the duty of bile in the right time and place. Dr. Harley (On Jaundice)

[1] Practitioner, Oct. 1881.
[2] Practitioner, xxiii. 336.
[3] Brit. Med. Journ. July 1879.

thinks that it (in doses of grs. v.) is best administered in gelatine capsules, so as to enable it to reach the duodenum unacted upon by the stomach. *In functional disorder of the Liver, and in Mesenteric Affections*, it is worthy of trial, given as above, but it is at the best a palliative, and of little use unless conjoined with other remedies. *In Hypochondriasis* associated with dyspepsia, it may be advantageously given combined with asafœtida and aloes.

1017. Ferrum. Iron.

Med. Prop. and Action. *The modus operandi of the Salts of Iron* is almost entirely through and upon the blood, which it improves by increasing the quantity and improving the quality of the blood-corpuscles—hence the term hæmatinic. It has been amply shown that the administration of iron rapidly cures the blood poverty which is found in anæmia. As a prophylactic to tuberculosis iron has by many been held to take a high position. Its action in this respect must be regarded in the present state of our knowledge as indirect.

When taken internally, the salts of iron are absorbed into the system, and have been detected in the blood, the urine, and the milk; a portion of them passes off by the bowels, in the form of the sulphide, as is evidenced by the black fæces which are always observed after a few doses of any of the stronger salts of iron. Under their use the digestion is improved, the appetite becomes greater, the pulse increases in frequency and fulness, and the general health improves; the patient at the same time gains flesh and colour. These effects are often very marked. From some observations by Dr. Pokrowsky, it appears that under the use of iron, the temperature of the body, whether previously normal or morbidly depressed, rises, and the daily amount of urea excreted in the urine is increased. The weight of the body also is augmented. These effects were produced alike by all the preparations of iron. In some persons, the salts of iron cause great gastric irritation. In excessive doses, they are irritant poisons.

1018. *Remarks on the Use of the Salts of Iron.* 1. In excessive anæmia, whether from hæmorrhage or any other cause, the stronger salts of iron, the sulphate or perchloride, are chiefly indicated. In ordinary debility the milder ones, the ammonio-citrate, or the potassio-tartrate, are to be preferred. The more readily soluble salts of iron should in most cases take the precedence of the oxide and other more insoluble preparations, unless some special superiority can be established for the latter.

2. No advantage is to be gained by giving any of them in very large doses.

3. Any gastric irritation which arises from their use may be obviated by the addition of extracts of hyoscyamus, or conium. If one salt should disagree, a milder one may be substituted.

4. Acids and acidulous fruits should be avoided during their use, as, by combining with them in the stomach, other compounds may be formed, which may either give rise to irritation, or render the remedy less active.

5. From the researches of Dr. Woronichin[1] it appears that the administration of chloride of sodium, common salt, simultaneously with iron, enables a considerable proportion of the iron to be stored up in the organism; on the other hand, that a similar amount of chloride of potassium would cause nearly all the iron exhibited to be discharged in the secretions.

6. During a prolonged course of iron, it should be intermitted for a short time, every ten or fifteen days, in order to ascertain the real state of the alvine secretions.

7. Occasional purgatives greatly increase the efficacy of the salts of iron.

8. They are best administered immediately after meals, excepting after tea.

9. In anæmic states, the salts of iron are productive of the best effects, up to a certain point—that is, until the blood contains its normal amount of iron—

[1] Practitioner, Dec. 1868.

if continued beyond this point, a state of plethora is induced, and indigestion and general derangement result as a natural consequence.

10. In order to judge fairly of the effects of iron, it requires to be persevered in for several weeks, or longer.

11. A little lemon or lime juice is said effectually to disguise the taste of the salts of iron.

12. As the more astringent preparations not only stain but injure the teeth, they may be conveniently sucked through a glass tube. (Farquharson.)

Iron is contra-indicated—1, in all inflammatory affections; 2, in congestions; 3, in plethora or plethoric states of the system; 4, in the sanguine temperament generally.

1019. Ferrum Redactum. Reduced Iron.

Med. Prop. and Action. A powerful hæmatinic and tonic. It is usually easily borne on the stomach, but sometimes gives rise to disagreeable eructations of sulphuretted hydrogen gas. It does not possess the inky taste of other ferruginous preparations—a circumstance which enhances its value as a medicine for children. Like other preparations of iron, it blackens the stools, but it causes little, if any, constipation. It may be given in the form of pill or powder, or in lozenges made with chocolate. It is taken advantageously with a meal.

Dose:—Gr. i.-v.; *of Lozenges*, B.P. (each contains gr. j.), i.–vj.

1020. *Therapeutic Uses. In Anæmia, Chlorosis,* and some forms of *Amenorrhœa,* it exerts the same beneficial influence as other ferruginous preparations. It has been given with advantage in *Chorea.* M. Coste states that he has used it with good effect in cases of *Enlarged Spleen following Ague*, in doses of gr. $\frac{3}{4}$–ij.

1021. Liquor Ferri Dialysatus. Solution of Dialyzed Iron.

Med. Prop. and Action. A clear, neutral, nearly tasteless, dark-red liquid, prepared by dialyzing a solution of the chloride of iron. Its exact chemical composition is uncertain; it contains a minute portion of the chloride (about 4 per cent.), and it is possible that the iron exists as a basic oxychloride. It bears dilution with pure water, but is at once precipitated by alkalies, salts, &c. It becomes absorbed into the system when taken internally. Its tastelessness, harmlessness to the teeth, and comparative freedom from astringency have rendered it a favourite chalybeate; but the assertion that it never constipates is an error. It should never be given in combination. The dose is 10 to 30 minims. Dialyzed iron seems to be the *best antidote for Arsenic.* It is harmless, and in case of poisoning a teaspoonful should be administered at once and repeated as occasion requires. (Dr. H. Wood, p. 98.) These remarks coincide in the main with those of Dr. Prosser James,[1] who, however, prescribes it in smaller doses, viz., 10 to 20 drops in a little water or on a lump of sugar, after every meal. He mentions that Prof. Da Costa has used it hypodermically with great benefit, beginning with ɱxv., and soon increasing it to ɱxxx. No inconvenience, local or general, was produced, and he suggests this method of administration in *Gastric Ulcer, Pernicious Anæmia,* and when, from defective absorption or assimilation, it seems desirable to introduce the remedy directly into the system. This solution was incorporated into the B.P. for the first time in the edition of 1885.

1022. *Therapeutic Uses. In Anæmic states* when iron is indicated, this preparation, being bland and unirritating, proves very serviceable.

[1] Med. Times, Dec, 2, 1882.

1023. Ferri Acetatis Tinctura. Tincture of Acetate of Iron.

Liquor Ferri Acetatis. Solution of Acetate of Iron.

Liquor Ferri Acetatis Fortior. Strong solution of Acetate of Iron.

The two liquors were introduced into the B. P. of 1885, the weaker one being of the same strength as the tincture.

Med. Prop. and Action. The preparations of the acetate of iron are agreeable, mild chalybeates. An ethereal tincture of the acetate has been recommended by Dr. Waters in the treatment of *Pulmonary Emphysema* of the degenerative form, especially when complicated with bronchitis. From its stimulating properties it acts as an expectorant. He gives it in acute attacks of *Bronchitis complicating Emphysema*, as soon as the urgent symptoms are ameliorated, and whilst the secretion from the bronchial tubes is still profuse. Dr. Meadows[1] regards the ethereal tincture in 3ss. doses as the most effective chalybeate astringent for controlling *Hæmorrhage connected with Uterine Tumours.*

Dose:—Tincture or Liquor, ♏xv.–xxx. Strong Solution, ♏j.–viij.

1024. Ferri et Ammonii Citras. Citrate of Iron and Ammonium.

Med. Prop. and Action. A mild and valuable tonic and hæmatinic in doses of grs. v.–x. in solution. It is particularly adapted for children, and for those cases where the stomach is too irritable to bear the more powerful salts, as it is devoid of any unpleasant taste, possesses scarcely any astringency, and its properties are extremely mild and unirritating.

Dose:—Of Vin. Ferri Citratis (B.P. 1885), 3j.–iv.

1025. *Therapeutic Uses. In Debility after exhausting Diseases, and in the Anæmic states of Children*, this preparation of iron is a valuable and efficacious remedy. It is particularly indicated in irritable states of the stomach, when it may be advantageously combined with infusion of calumba.

1026. *In Scrofulous Affections of Children, Tabes Mesenterica, &c.*, it is eminently serviceable. To a child of three years old, grs. ij. may be given twice or thrice daily.

1027. *In Dyspepsia occurring in Scrofulous subjects*, it is often productive of excellent effects. *In the Cachexia which accompanies Ulcer of the Stomach*, especially in chlorotic females, this salt, or the ammonio-tartrate, as being the mildest, is the best form of iron to commence with, and is the best tonic which can be employed. Experience has fully confirmed the efficacy of the salts of iron in these cases, excepting when frequent vomiting, or excessive or continuous pain, is present; these states indeed contra-indicate their use. Dr. Brinton directs that they should be given in solution with or immediately after food—a general rule in using them which the presence of an open ulcer makes doubly important. The insoluble oxide should be avoided.

1028. *In Cancer of the Uterus*, Dr. West (p. 406) usually employs the ammonio-citrate, grs. v. thrice daily, with some effervescing medicine—*e.g.*, citrate of ammonia. The stronger salts are apt to disagree.

[1] Lancet, May 13, 1873.

1029. Ferri Arsenias. Arseniate of Iron. Arseniate of Iron partially oxidised.

Med. Prop. and Action. Alterative-tonic. It is believed to possess the combined properties of iron and arsenic. It is chiefly used in skin diseases associated with anæmia.

Dose:—Gr. $\frac{1}{16}$–$\frac{1}{2}$.

1030. *Therapeutic Uses. In Elephantiasis, Eczema, Psoriasis, Lepra, Lupus, Lichen,* and in other obstinate cutaneous diseases. According to Duparc, this salt, in doses of gr. $\frac{1}{5}$ daily, is competent in the adult to effect the cure of a *Herpetic* or *Squamous Affection,* however extensive or long-established.

1031. *In Cancer,* it was employed externally, but from the danger attendant upon the application of arsenical preparations to ulcerated surfaces, it has been abandoned in these cases.

1032. Ferri Bromidum. Bromide of Iron. Is best given in the form of Syrupus Ferri Bromidi (syrup of bromide of iron).

Med. Prop. and Action. Tonic and resolvent. In America it has been used with benefit in the treatment of *Scrofulous Tumours, Glandular Enlargements, Erysipelas,* and *Amenorrhœa.* On the Continent it has been successfully employed in the treatment of *Hypertrophy of the Uterus.* It appears to resemble the iodide in its therapeutical action. The syrup has been prescribed in *Phthisis, Tubercular Affections,* and *Bronchocele.* Externally, it has been used in the form of ointment, as an application to *Scrofulous Swellings.* (Bromide of Iron, 1 part; Glycerine, 1 part; Pure Lard, 14 parts.) (Draper.)

Dose:—Of the Bromide, gr. j.–gr. iij. in pill; *of the Syrup,* ɱxx., gradually increased.

1033. Ferri Carbonas Saccharata. Saccharated Carbonate of Iron.

Carbonate of iron may also be given in aërated solution. 3,000 parts of a solution of carbonic acid prepared at the ordinary pressure of the atmosphere will hold in solution one part of carbonate of iron. If the solution be made with the aid of the apparatus employed in manufacturing aërated waters, it has the advantage of being less liable to change, and of containing an excess of carbonic acid. (Draper.)

Dose:—Gr. v.–xxx.

1034. *Therapeutic Uses.* Similar to those of Ferri Peroxidum (*q.v.*).

1035. *In Migraine associated with Anæmia,* Dr. Anstie[1] advises the saccharated carbonate in doses of grs. x.–xx. thrice daily.

1036. *In Habitual Constipation,* such as is *associated with Anæmia,* the carbonate of iron proves itself very serviceable.

1037. Ferri Iodidum. Iodide of Iron.

Med. Prop. and Action. Alterative-tonic, and emmenagogue. The syrup is the best form for administration. It is a very valuable salt, and is particularly adapted for persons of a scrofulous diathesis. Its effects as a tonic are soon evident, promoting digestion, increasing the appetite, and improving the general health. It is absorbed into the system, and is eliminated by the kidneys, both the constituents having been detected in the urine after its administration. In large doses (grs. x.) it occasions gastric irritation.

Dose:—Of the Syrup (B.P. 1885), ʒss.–ʒj.; *of the Pill,* gr. iij.–viii.

[1] Practitioner, Dec. 1872.

1038. *Therapeutic Uses.* *In Anæmia connected with Phthisis and Scrofula*, this is one of the best of tonics, where it does not prove too stimulating. It seems to promote the secretions more than any of the other salts of iron, and it sometimes acts as a diuretic. It may also be given with advantage in all cases of *Anæmia associated with glandular enlargements and other scrofulous manifestations.* The syrup, in doses of ℥xx.–f℥j. thrice daily, is the best form.

1039. *In Phthisis*, it was introduced by Dupasquier in 1841. Dr. Cotton thus sums up the result of his experience with it in phthisis:—1. Syrup of the iodide of iron, in doses of f℥j. twice or thrice daily, occasionally produces headache, with some dyspeptic symptoms, but for the most part it agrees very well with consumptive patients. 2. Although very far from exhibiting a specific effect, it nevertheless seems to act very beneficially in a fair number of consumptive cases, especially when the disease is only in an early stage. 3. Under its influence the patient's weight is generally increased. It may be advantageously combined with cod-liver oil.

1040. *In Chronic Hydrocephalus* the iodide was favourably reported of by Dr. Ramskill. Amongst the children of the poor, he remarks, the combination of cod-liver oil and syrup of the iodide almost always gives satisfactory results.

1041. *In Amenorrhœa and Dysmenorrhœa*, the iodide is of great value, particularly in women of a scrofulous habit. A return of the catamenia, in many instances, speedily follows the use of the iodide; it is best given in the form of the syrup, f℥ss.–℥j. thrice daily. *In Chlorosis and Leucorrhœa*, accompanied by much torpor of the system, and where none of the symptoms referable to particular organs are very marked, the iodide often proves very serviceable.

1042. *In Chronic Rheumatic Gout*, in anæmic patients, the syrup of the iodide (f℥j.) given with f℥iij. of cod-liver oil, often is useful. The cutaneous and intestinal secretions should at the same time be attended to.

1043. *In Constitutional Syphilis*, in cachectic subjects, the iodide often proves most useful. According to Hill and Cooper (p. 430), it is very effective in *Rupia*, or *Ulceration of the Skin*, associated with well-marked poverty of blood. In children, they add, it is also exceedingly useful if they remain feeble after the syphilitic symptoms have subsided.

1044. *In Incontinence of Urine*, Dr. J. Barclay[1] regards the syrup of the iodide of iron as superior to all other remedies. He proved its efficacy in twenty cases. The dose is ℥xxv.–xxx. after each meal, thrice daily.

1045. Ferri Perchloridi Liquor. Solution of Perchloride of Iron.

Med. Prop. and Action. Powerful astringent and styptic, whether administered internally or applied externally. According to M. Deleau,[2] it is the most powerful hæmostatic known, acting as a modifier of living tissues

[1] Med. Times, Dec. 17, 1870.

[2] Ann. de Thérap. 1858, p. 213.

generally, but especially of the mucous membranes; hence its value as an anti-syphilitic and anti-scrofulous remedy. A hæmostatic cotton wool, said to be an excellent dressing for wounds, is proposed by Dr. Ehrle.[1] The cotton is first soaked for an hour in a solution containing 4 per cent. of soda, then washed and dried, and subsequently dipped two or three times in a weak solution of perchloride of iron, dried, and pulled apart by the fingers.

Dose:—mx.–xxx. in syrup or water.

1046. *Therapeutic Uses. In Aneurisms*, injections of the perchloride were first advised by Dr. Pravaz, of Lyons, in 1853; and cases of its successful application were recorded by Adams and others; but, according to M. Malgaigne, the practice is fraught with so much danger that no prudent man should have recourse to it. He states that of eleven cases treated by it there were four deaths, five serious complications, and only two cures. Hence it has fallen into disrepute. Injections of the perchloride have also been employed by Desgranges and others for the cure of *Varicose Veins*, but both the safety and efficacy of the treatment are very doubtful.

1047. *For the cure of Nævus*, injection of solution of the perchloride has proved effectual, and it has the recommendation, when successful, of leaving hardly any visible trace of its action. It acts by coagulating the blood in the vessels, and thus obliterating them. It is difficult, however, first to be certain that the fluid will permeate the nævus, and secondly, if it does so, to regulate the quantity. Moreover, its use is attended with positive danger when thus applied to nævi about the head, face, orbit and neck, cases of instant death having occurred in several instances when thus employed. General experience has confirmed the dictum of Mr. T. Smith[2] that we are justified in rejecting the perchloride as a remedy for nævi in these parts.

1048. *In Hospital Gangrene*, the value of the local application of the perchloride is attested by M. Maupin[3] and others. It is thought to be superior to the mineral acids. The pain it causes is at first excessive, but this soon subsides. A severe case of *Onychia*, cured by the application of an ointment composed of equal parts of the perchloride and lard, is recorded by Dr. Alcantara. In *Zona*, at any period during its evolution, Dr. Gressey recommends the application of a concentrated alcoholic solution of the perchloride. The vesicles should not be opened, in order to save the patient useless pain.

1049. *In Post-partum Uterine Hæmorrhage*, Dr. R. Barnes[4] has for years employed with success injections of solution of the perchloride (half a pint of the strong solution to a pint and a half of water). He employs Higginson's syringe fitted with a uterine tube about nine inches long. Care should be taken that air is not sucked up into the syringe; to avoid this, it is necessary to keep the entrance-tube of the syringe at the bottom of the fluid, and pump through back into the basin containing the solution, until the syringe is filled with the fluid. The apparatus being ready, the left hand should be passed into the uterus, to clear away all

[1] Brit. Med. Journ. Jan. 14, 1871.
[2] Lancet, Aug. 17, 1867.
[3] Mém. de Méd. Militaire, xx. p. 368.
[4] Lancet, Jan. 30, 1869.

placenta and clots, and the uterine tube slipped along the palm of the hand, so as to carry the end of the tube up to the fundus of the uterus; the syringe should then be compressed gently and steadily, so that the fluid may trickle down over the whole inner surface of the uterus. The pumping may be repeated until the basin is *nearly* empty, not quite, lest air be taken up. As the iron acts by coagulating the blood in the mouths of the vessels—and mere contact is enough for this—it is unnecessary to pump with any force. One injection generally suffices. Employed thus, Dr. Barnes considers this injection perfectly safe, and he adds that he is certain not a few lives have been rescued by it from otherwise imminent death.[1] This treatment he considers[2] also to exercise a marked influence in *preventing Puerperal Fever*. For *Arresting Hæmorrhage in Cancer of the Uterus*, the perchloride has come into general use. "The saturated solution in glycerine, as recommended by the late Sir J. Simpson (Dis. of Women, 1872, p. 164), is one of the most convenient forms for its application to the diseased surface, and Dr. Barnes's plug speculum affords a convenient mode for its introduction. (Dr. West, p. 402.) The same remarks apply equally to *Hæmorrhage connected with Fibroid Tumours of the Uterus*. The undiluted solution has also been applied to *Uterine Polypi* and *to Ulcers of the Os and Cervix Uteri*. The objection to the perchloride as a topical application in diseases of the uterus and uterine passages is that, unless very much diluted, it corrodes the epithelium of the mucous membrane of the vagina. To prevent this, Dr. Braun adds crystallized carbonate of soda (grs. iv.) to the solution of the perchloride (f℥j.): chloride of sodium is formed; but the hæmostatic properties of the perchloride are, according to Dr. Braun, intensified rather than diminished by the alteration. He speaks highly of this neutralized solution in various *Chronic Uterine Affections*.

[1] This practice has been the subject of much controversy, from which we glean: 1. That the perchloride is the most powerful and reliable styptic in post-partum hæmorrhage. 2. That though death, apparently due to the perchloride, has taken place in some instances, yet the ratio of deaths from flooding would have been greatly increased had it been withheld. 3. That it has been the means of saving many lives when all other remedies had failed, and the patients were *in extremis*. 4. That as a certain amount of danger attends its use, it should not be resorted to until the failure of other ordinary and safer means, *e.g.*, firm pressure on the uterus, the external application of cold, compression of the abdominal aorta, the introduction of a plug, or the subcutaneous injection of ergotine; on the other hand, it would be literally, in some instances, a *fatal* error to delay the intra-uterine injection too long. 5. That previous to its use all coagula should be carefully removed from the uterine cavity; this is best effected by the injection of hot water, which of itself is sometimes effectual in arresting the bleeding (see Water). 6. That it is essential that the tube be well introduced into the uterus, up to the fundus in fact, before commencing the injection. 7. That the injection should be made slowly and gently so as to allow the fluid to irrigate every part of the intra-uterine surface. 8. That the strength of the solution employed varied much, *e.g.*, 1 to 2 of water (Atthill), 1 to 3 (Barnes), 1 to 6 (Playfair), but there is no more danger in the use of the stronger than the weaker solutions. 9. The quantity of fluid required in each case must be regulated by its effect—the arrest of the hæmorrhage; that being accomplished, it should be suspended: 6 to 8 oz. was the maximum found requisite by Dr. Atthill. As little as 4 oz. sufficed in some instances. 10. In place of injection it has been proposed to introduce into the uterus a sponge (attached to a whalebone probe) saturated with the solution, and with it to swab over the whole of the intra-uterine surface. It is thought to be as effectual and safer than the injection.

[2] Obstetric Trans. vii. 1866, p. 31.

1049*. *In Laryngeal Phthisis*, the local application of mineral astringents, by diminishing the irritability of the mucous membrane, often quiets the cough. Of these, Dr. M. Mackenzie (p. 384) states that he has found the perchloride of iron (Liq. f℥j., Aq. f℥j.) the most serviceable. He likewise regards it as one of the most effective astringents in *Enlarged Tonsils*. A solution (f℥j.–ij., Aq. ℥j.) may be painted over the tonsils twice daily (p. 68). *In Cystic Bronchocele*, he successfully employed, in thirty-eight cases, injections of the perchloride.[1]

1050. *In Erysipelas*, Dr. Leavens White[2] strongly commends the following application:—℞ Liq. Ferri Perchlor. Fort., Spt. Vini Rect. equal parts. M. To be painted over the whole of the affected surface, and an inch beyond it by means of a camel's hair brush.

1050*. *In Dysentery*, M. Baudon obtained excellent effects from this solution (gutt. xij.–xxx. in water and syrup in the twenty-four hours). He also used it (gutt. xij.–xxv.) in enemas, combining it it with opium if there was much pain. Mr. W. H. T. Power[3] also has employed, with the best results, the tincture of the perchloride in dysentery. From ♏200 to ♏600 per day were given, the average dose being ♏x. in ℥j. of water. Its effects in arresting the liquid stools were speedily evident.

1051. Ferri Perchloridi Tinctura. Tincture of the Perchloride of Iron.

Med. Prop. and Action. Hæmatinic, tonic, astringent, and diuretic. It is one of the most powerful of the preparations of iron, and may be advantageously administered whenever these are indicated. Externally applied, it is caustic, and is applied to *Warts*, &c., and as a styptic to superficial wounds. In large doses it is an irritant poison.

Dose:—♏x.–xxx.

1052. *Therapeutic Uses. In Incontinence of Urine in Children* it is occasionally of great service. Dr. West found it more useful than any other remedy, given in doses of from ♏iij. to ♏x. thrice daily, alone or combined with a few drops of tincture of henbane.

1053. *In Atonic Hæmorrhage from the Kidneys, Uterus*, and *Bladder*, occurring in debilitated subjects, it may be given with much advantage, in doses of ♏x.–xx. several times daily. *In Hæmaturia*, Dr. Owen Rees considers this the best form of iron for internal use. *In Hæmorrhage from the bowels in Typhoid Fever*, the tincture often proves effectual. If associated with much arterial action it may be combined with digitalis. ℞ T. Ferri Perchlor. ♏xxx., T. Digitalis ♏xv., Aq. Menth. Pip. ℥iss., repeated every four hours. If this fail, the solution may be tried in enema:—℞ Liq. Ferri Perchlor. ♏xv., Morphiæ Hydrochlor. gr. ss., Aq. Tepid. ℥iv. M. (Dr. Harley, i. p. 633.)

1054. *In Leucorrhœa, Chlorosis, and Dysmenorrhœa*, this tincture may be employed with every prospect of benefit. When, as is often the case in these affections, dyspepsia co-exists, it may be advan-

[1] Lancet, May 11, 1872.
[2] Brit. Med. Journ. Dec. 9, 1876.
[3] Practitioner, Aug. 1868.

tageously conjoined with calumba, or it may be given combined with chloride of ammonium.

1055. *In Irritability of the Bladder consequent on Cystitis*, Dr. West advises this tincture in doses of ℥xv.–xx. three or four times a day, together with gr. $\frac{1}{6}$–$\frac{1}{4}$ of morphia at bedtime.

1056. *In Gonorrhœa*, when the acute stage is past, and the discharge continues and is degenerating into gleet, few remedies prove more useful than this tincture in doses of ℥xv.–xx. thrice daily. *Nocturnal Emissions* sometimes yield to drachm doses of the tincture taken at bedtime.

1057. *Other Diseases.* *In Bright's Disease*, especially when associated with anæmia, the salts of iron are clearly indicated: indeed, Dr. Roberts (Syst. v. p. 525) regards saturation of the system with iron as the best safeguard against the profound anæmia accompanying renal degeneration. When the stomach will bear it, no preparation of iron is superior to the tinct. of the perchloride ℥xv.–xxx. twice or thrice daily. Dr. G. Johnson[1] has found great benefit from combining each dose with grs. x. of the chloride of ammonium. This, and the syrup of the phosphate in ʒj. doses, he has found specially useful in this disease. In scrofulous subjects it is best conjoined with cod-liver oil. Mr. Dutt relates a case of *Chylous Urine* cured by this tincture, ℥xv. in infusion of quassia thrice daily.

1058. *In Beri-beri*, it was strongly advised by Mr. Ridley, who saw much of this disease in Ceylon. Mr. Malcolmson,[2] in quoting this, remarks that iron is one of the most approved remedies of the Telúgú doctors. They use it, mixed with the astringent juice of the mango and other trees; probably in the form of an oxide, united with gallic acid.

1059. *In Phthisis*, the perchloride is a remedy of considerable power. Dr. Symes Thompson[3] bears strong testimony to its value, regarding it as far superior to other forms of iron. The improvement of appetite, diminution of flatulence, &c., he remarks, which occur under the perchloride are often remarkable; cod-liver oil, and other fats previously refused, being digested without discomfort. "It both checks *Diarrhœa* and relieves constipation by giving tone to the feeble muscular fibres of the bowels; it lessens *Night Sweats*, though these often call for oxide of zinc in addition, and is a valuable remedy in *Hœmoptysis*." *In Chronic Bronchitis with Emphysema*, a combination of this tincture and chloride of ammonium is favourably noticed by Dr. Thorowgood;[4] or, he adds, we may give the sulphate of iron with sulphate of magnesia in mint water.

1060. *In Erysipelas*, the value of the tincture of the perchloride, first brought prominently to notice by Mr. G. H. Bell, of Edinburgh, in 1851, is now generally recognized. Indeed, so marked is its action that it has been supposed by some to exercise a "specific" influence in erysipelas; but without admitting this, it is certain that no remedy

[1] Brit. Med. Journ. June 21, 1873.
[2] On Beri-beri, p. 284.
[3] Practitioner, Sept. 1868.
[4] Lancet, Nov. 13, 1869.

is productive generally of better effects. In order to obtain its full influence, as pointed out by Dr. Russell Reynolds (Syst. i. p. 690), it is essential to give it in large and repeated doses (ℿxl. or more) every four hours. He advises the following formula:—℞ T. Ferri Perchlor., Spt. Chloroformi, Glycerini āā ℿxl., Aq. ad ℥jss. M. To be taken every four hours. Dr. Leniham[1] obtained excellent results from painting the inflamed surface twice a day with the tincture of the perchloride, at the same time giving it internally. (See also Liquor Ferri Perchlor.) Dr. Charles Bell, brother of the above gentleman, also bears testimony to the value of this remedy, particularly in *Infantile Erysipelas;* also in *Puerperal Fever.* In various forms of *Erythema* its influence is also often very marked.

1061. *In Scarlet Fever,* in the advanced stages, attended by albuminuria and hæmaturia, the tincture of the perchloride is a remedy which often produces excellent results. In the words of Dr. Gee, "Upon the whole, no remedy is equal in value to the perchloride of iron." Its use should be associated with generous diet. Should it not succeed, gallic acid should be tried. Its efficacy is attested by Mr. H. Meade, who prescribed it with signal benefit in doses of ℿv.–xv., according to the age of the patient, every three or four hours.

1062. *In Cardiac Affections,* this preparation, as well as other forms of iron, deserve more attention than is usually paid to them. *In Fatty Degeneration of the Heart,* Dr. Waters believes that, if taken in small doses for a long time, it is capable of restoring to an enfeebled and fatty heart a good deal of its vigour, and possibly of its structure. But in order that it may do this, it must be continued even for years, being omitted from time to time as the state of the digestive organs may require. He considers that there is probably no better preparation than T. Ferri Perchlor., but if patients are unable to take this or other ordinary preparations of iron, recourse may with advantage be had to a chalybeate water. *In Chronic Valvular Disease,* it is, according to Dr. Waters, no less valuable, given continuously as above directed. *In Palpitations,* and also in *Dropsy connected with Heart Disease,* he advises a combination of iron and digitalis, or, where the dropsical symptoms are slight, he considers iron alone sufficient.

1063. *In Diabetes associated with Anæmia,* the salts of iron are indicated. Dr. Brunton (Syst. v. p. 425), recommends a combination of the perchloride in tincture (ℿxv.) and morphine (gr. $\frac{1}{12}$), the proportion of the latter being gradually increased. Should the perchloride disagree, a weaker form—*e.g.* dyalized iron—may be substituted.

1064. *In Hydrothorax,* Dr. Anstie considers the perchloride in tincture (ℿxx. four or five times daily), commencing its use the moment that a decided impression has been produced either by diuretics or purgatives, offers the best chance of preventing re-accumulation of the fluid.

1065. *In Hysteria connected with Anæmia,* the tincture ℿviij.–x.

[1] Lancet, May 8, 1880,

in combination with Spt. Ammon. Fœtid. is often of the greatest service. Bathing, generous diet, and gentle exercise should be also enjoined. *In Pain of the left side so often associated with Hysteria* it is advised by Dr. Peter Eade. He states that in those cases where leucorrhœa co-exists, he has frequently found the following formula signally officacious:—℞ T. Ferri Perchlor., Acid. Nitric. dil., T. Aurant. āā ℥xv., Magnes. Sulph. gr. xxx., Aq. ad ℥j. To be taken two or three times a day.

1066. *In Acute Rheumatism*, Dr. Russell Reynolds has employed the tincture of the perchloride with marked success, in doses of about ℥xxx. every six hours. He has found the relief of the joint affection definite, uniform, and speedy, whilst the duration of the disease has been shortened. Other cases successfully treated with it are recorded by Dr. Randle Buck,[1] Dr. J. F. Duncan,[2] and others; but it proved a failure in the hands of Dr. Greene;[3] and Dr. Southey's[4] experience is not favourable to its claims. In the acute continued cases, he says, it has been too frequently associated with hyperpyrexia to allow him to regard it as altogether free from danger, whilst in the relapsing forms he found it neither shorten the cases nor prevent relapses. Dr. Anstie[5] adduces facts to show that the tincture in large and frequent doses at the very outset of an attack of acute rheumatism possesses the power of cutting it short, and that it possesses veritable prophylactic powers in these cases.

1067. *In Diphtheria*, this tincture, as first pointed out by Dr. Heslop of Birmingham,[6] in 1858, is a remedy of great value. Amongst others who have testified to its utility is Dr. W. Squire,[7] who directs ℥xx.–xl. should be given with water (℥ss.) and glycerine (ʒss.) every three or four hours, or oftener, so that not less than half an ounce of the tincture be taken in the twenty-four hours; and this quantity, he adds, may be given even to children during severe attacks. It should be commenced on the first day of the illness, or as soon as the patient comes under notice, and continued till the tongue becomes red, and the throat improves; when deposit has already taken place, its good effects will be shown, not by any alteration in the dimensions of the patch, but by a diminution in the accompanying secretion, and by improvement of the general symptoms. It is not to be discontinued for some days, and may require energetic repetition if improvement is slow. Its general effect, observes Dr. M. Mackenzie (p. 160) is often extremely favourable, and its local influence is equally well-marked, the soreness and pain in the throat being considerably relieved after each dose. As a local application, the tincture alone, or diluted with equal parts of glycerine, sometimes appears to have a beneficial effect.

1068. *In Purpura Hæmorrhagica*, it is regarded by M. Pize as pre-eminently the agent for the cure of the disease. He states that

[1] Brit. Med. Journ. Dec. 18, 1869.
[2] Dublin Journ. Med. Sci. June 1875.
[3] Brit. Med. Journ. April 9, 1870.
[4] St. Barth.'s Hosp. Rep. 1878.
[5] Practitioner, Sept. 1871.
[6] Med. Times, May 29, 1858.
[7] Reynolds' Syst. Med. i. p. 404.

it arrests the hæmorrhagic tendency in twenty-four or forty-eight hours, and that when continued for a few days it rapidly brings about convalescence.

1069. *In Favus*, Sir E. Wilson prescribes the salts of iron internally, but prefers the tincture of the perchloride in doses of ♏x. thrice daily, for a child ten years old. If the disease is associated with scrofula, it may be combined with cod-liver oil.

1070. *In Epistaxis*, the injection into the nostrils of the dilute tincture (ʒjss.–ij. in Aq. ℥vj.) is often effectual in arresting the hæmorrhage. *In Hæmorrhage from Leech-bites*, and in that after the *Extraction of Teeth*, the undiluted tincture acts as a good styptic.

1071. *Hæmorrhoidal Tumours* have been successfully treated by injections of the perchloride in tincture. An illustrative case is recorded by Mr. Colles of Dublin.[1] He injected ♏xx. into each tumour.

1072. *In Venereal Warts and Spongy Granulations*, the undiluted tincture, locally applied, is a safe and efficient caustic. *Ulcers attended with profuse discharge*, are much benefited by the application of this tincture, either pure or diluted.

1073. *For the removal of Thread-worms from the Rectum*, an enema containing the tincture (ʒss., Aq. ℥x.) is said to be very effectual.

1074. Ferri Pernitratis Liquor. Solution of the Pernitrate of Iron.

Med. Prop. and Action. Astringent and tonic in doses of ♏x.-xl. in water; diluted, it has also been used as an enema and injection.

1075. *Therapeutic Uses. In Chronic Dysentery*, Dr. Maclean speaks in the highest terms of the benefit he has derived from this solution, particularly in men returning from tropical regions, anæmic from loss of blood and the depraving influence of malaria. After a time the citrate of iron and quinine may be substituted. *In the Diarrhœa of Children*, its efficacy has been established by Mr. Kerr,[2] Prof. Graves, and many others. It may be given in doses of a few drops according to the age of the child, and it may be employed in the form of enema (♏x.–xij.) It appears to be a safe and efficient remedy.

1076. *In Exhausting Hæmorrhage, whether from the Lungs, Stomach, Kidneys, or Uterus*, this preparation is reported to be very efficacious. It requires to be given in large doses, from ♏xxx.–lx.

1077. *In Chronic Bronchitis, Diarrhœa, Dysentery, Pyrosis, Gleet, Menorrhagia, and Leucorrhœa*, Mr. Postage[3] employed it with signal benefit. He states that, in all diseases attended with much debility, profuse discharges from the mucous surfaces, and where tonics and astringents are indicated, he has found this remedy, in doses of gutt. x.–xv. thrice daily, very advantageous.

[1] Dublin Journ. Med. Sci. June 1874.
[2] Edin. Med. Surg. Journ. vol. xxxvii. p. 99.
[3] Med. Times, vol. xviii. p. 171.

1078. Ferri Peroxidum Hydratum. Hydrated Peroxide of Iron.

Med. Prop. and Action. Blood-restorative, tonic, and emmenagogue. It is also anthelmintic. The objections to its use are its disagreeable taste, and the quantity required to be taken before its specific effects are evident. It is an unirritating preparation of iron, although it occasionally causes dyspeptic symptoms; and during its use occasional aperients are necessary to prevent it accumulating in the intestines. It speedily blackens the fæces. It is best given in honey or treacle. Externally it is applied in the form of plaster.

Dose, gr. v.–xxx. or more.

1079. *Therapeutic Uses. In Anæmia*, this, in common with the other preparations of iron, is of great value. Combined with aloes it is often proved highly serviceable *in Atonic Amenorrhœa*, and with Spt. Ammon. Aromat. in *Chlorosis*.

1080. *Nervous and Spasmodic Affections. In Tic Douloureux and other Neuralgic Affections*, the peroxide of iron was formerly held in much repute, chiefly on the authority of Dr. Elliotson, who gave it in ʒj. doses every six hours. Its use is limited to those cases in which the neuralgia is associated with anæmia; in others it usually fails.

1081. *In Infantile Convulsions*, when associated with exhaustion or debility, iron preparations often exercise a salutary influence. They were specially recommended by the late Sir C. Locock, and a case in which the peroxide proved signally beneficial is recorded by Dr. S. Lawrence,[1] who considers that in these cases it acts as a nervine or nerve-tonic, lowering the sensibility of the nervous system when preternaturally exalted. Under a similar view of its action, Dr. Merci[2] advocated its employment in *Laryngismus Stridulus*, but he advises its use being preceded by cod liver-oil. If this disagrees or produces no benefit, iron, he thinks, may be had recourse to with every prospect of success. In all these cases it is necessary to watch, lest the bowels become overloaded.

1082. Ferri Phosphas. Phosphate of Iron.

This is the only officinal phosphate, but there are several others met with in commerce—*e.g.*, the perphosphate, the superphosphate, and the pyrophosphate. In addition to these there are several compounds—*e.g.*, Syrup. Ferri Phosphatis Co. (Parrish's Chemical Food), Syrup. Ferri Quininæ et Strychninæ Phosphatis (Easton's Syrup, Triple Phosphate), Syrup. Ferri et Manganesii Phosphatis, Syrup. Ferri Hypophosphitis (Churchill), &c.

Med. Prop. and Action. All the above preparations agree in possessing the properties of ferruginous compounds modified and increased by the ingredients with which they are associated.

Dose:—Of the various Phosphates, grs. iii.–x. *Of the officinal Syrup*, ʒi.–ij.: each fʒ contains one grain of the phosphate. *Of the other Syrups*, about fʒj. The Compound Syrup (Parrish's Chemical Food) contains in each fʒ gr. j. Phosphate of Iron, and 2½ gr. Phosphate of Lime besides small quantities of Phosphate of sodium and potassium. Easton's Syrup (the Triple Phosphate) contains in each fʒ 1 gr. Phosphate of Iron, 1 gr. Phosphate of Quinine and $\frac{1}{32}$ gr. of Phosphate of Strychnine.

[1] Edin. Med. Journ. June 1858. [2] Edin. Monthly, June 1850.

1083. *Therapeutic Uses.* *In Atonic Dyspepsia*, especially in that occuring in delicate, anæmic young women, few remedies are more useful than the compound syrup (Parrish's Chemical Food) in drachm doses twice or thrice daily, at or after meals. *In the Debility of Childhood, Tabes Mesenterica*, &c., it likewise often proves highly serviceable, either alone or conjoined with cod-liver oil, &c. Dr. F. Churchill[1] states that in the treatment of *Rickets*, he has substituted the syrup of the hypophosphite for "the chemical food" in a large number of cases, and that he has found its effects very marked in the gradual solidification of the bones.

1084. *In Bright's Disease*, Dr. G. Johnson[2] has found the syrup of the phosphate in drachm doses, twice or thrice daily, especially useful. He places it on a par with Tinct. Ferri Perchlor. *q.v.* *In Diabetes*, the phosphate is favourably spoken of by Prout, Venables, &c., but it has fallen into disuse.

1085. *In Enuresis* in scrofulous children, Dr. Phillips (p. 589) states that a teaspoonful of Parrish's food twice daily in water is an excellent remedy for the nocturnal as well as the diurnal form arising from vesical irritability.

1086. FERRI ET QUININÆ CITRAS. Citrate of Iron and Quinine.

Med. Prop. and Action. This preparation possesses the properties of both iron and quinine, and is admirably adapted for children and delicate females, being easily borne when the stronger salts of iron are inadmissible.

1087. *Therapeutic Uses.* Those of the salts of iron generally. *In Chlorosis*, Sir H. Marsh advises the following formula:—℞ Liq. Ammon. Citrat. f℥iij., Ferri et Quin. Citrat. gr. j.–iij., Syrup. f℥j., Aq. ℥vj. A draught which is to be taken twice or thrice daily.

1088. FERRI SULPHAS. Sulphate of Iron.

FERRI SULPHAS EXSICCATA. Dried Sulphate of Iron.

FERRI SULPHAS GRANULATA. Granulated Sulphate of Iron.

Med. Prop. and Action. One of the stronger and most effective of the salts of iron. It is absorbed into the system, and has been detected in the blood and in the urine after a few doses; it also rapidly renders the fæces black. In large doses it gives rise to much gastric irritability, which may be partially obviated by combining it with ext. hyoscyami vel conii. In excessive doses it is an irritant poison.

As a disinfectant it possesses considerable power. Taking into consideration the cheapness of the crude salt (Copperas) and its great efficiency, Dr. H. Wood (p. 633) regards it as probably the best disinfectant that we have. He suggests that it acts by altering the course of putrefaction and destroying its products. If a rapid effect is desired, or a mass of solid material is to be acted upon, the copperas should be in solution; if a more persistent action is wanted, or if the mass be liquid, the salt in powder should be scattered over the material to be disinfected. Two pounds were found sufficient to disinfect (deodorize?) a privy for two days

As an Antidote. Dr. Du Vivier[3] has proposed, with the sulphate of iron as its basis, "to establish an officinal multiple antidote" for poisons. His formula is as follows:—Solution of Sulphate of Iron (Sp. 1·45) 100 parts, Water

[1] Brit. Med. Journ. March 27, 1880.
[2] Brit. Med. Journ. June 21, 1873.
[3] Brit. For. Med. Chir. Rev. June 1876, p. 234.

800 parts, Calcined Magnesia 88 parts, and Purified Animal Charcoal 40 parts. The iron solution is to be kept separately; the magnesia and charcoal in a bottle with the water. When required for use the liquids are to be mixed and thoroughly shaken together, and given in consecutive doses of ʒjss–iij. The author's experience proves that it renders the preparations of *arsenic*, *zinc* and *digitalis* completely insoluble, that it does not render oxide of copper entirely insoluble, that it leaves in solution an appreciable quantity of morphine and strychnine, and that it does not decompose nor precipitate the cyanide of mercury. As an antidote it is said to be superior to the Peroxide, *q.v.* Externally it is employed in lotion or washes (gr. j.–v.–x. ad Aq. ℥j.). The granulated sulphate is thought superior to the ordinary sulphate, inasmuch as it is less easily oxidized.

1089. *Therapeutic Uses.* *In Anæmia*, the sulphate is one of the most effective of the salts of iron. It may be given in the form of pill, with the extract of gentian; with a sedative, as conium; or with an aperient, as the compound rhubarb or aloes pill. It may also be given in solution with a little sulphuric acid, which adds to its efficacy, and assists to keep it in solution. Dr. Ashwell advises it in combination with hops, thus:—℞ Ferri Sulph. gr. j.–ij., Ext. Humuli gr. ij.–iij. A pill to be taken thrice daily.

1090. *In Chlorosis*, the combination of sulphate of iron and aloes is often signally useful. *In Amenorrhœa and in Leucorrhœa*, it may be resorted to with every prospect of success. Dr. West (p. 43) recommends the following mixture:—℞ Ferri Sulph. gr. ix., Magnes. Sulph. ʒiij., Acid. Sulph. dil. ʒss., Syr. Aurant. ʒiv., Aq. Carui ad ℥vj. ℥j. to be taken twice daily.

1091. *In Cancer of the Uterus*, Dr. Ashwell found a solution of the sulphate of iron (ʒj.–ʒjss., Aq. Oj.) beneficial in diminishing the quantity, odour, and acrimony of the discharge. It is likewise recommended by Dr. West (p. 405) thus:—℞ Ferri Sulph. ʒj., Ext. Conii ʒiij., Aq. Oj. M.

1092. *In Piles attended with much Hæmorrhage*, and where the parts are not much inflamed, a solution (gr. ij., Aq. ℥j.) of the sulphate daily injected is of great service. In *Hæmorrhoids*, especially when ulcerated or when the constitution has become debilitated by the discharge, Dr. Cartwright[1] strongly recommends an ointment of the persulphate (gr. xxx.–lx., Ung. ℥j.) Injections containing the sulphate (gr. j.–ij., Aq. ℥j.) prove very serviceable in *Prolapsus of the Rectum*. They should be used daily for a week or more.

1093. *In Enlargements of the Spleen*, the sulphate of iron is a remedy of great value. *In Chronic Splenitis*, according to Cruveilhier, and in *Hypertrophy of the Spleen*, he has seen complete resolution of enlargements of the spleen, which have occupied half or even two-thirds of the abdomen. The sulphate may be given in doses of gr. vj.–x. daily, in combination with purgatives. It is the base of Shoolbred's Powder, which, for forty years, maintained a high character in India in these affections:—℞ Pulv. Jalapæ, P. Rhei, P. Calumbæ, Potas. Bitart. āā ʒj., Ferri Sulph. gr. xxx. M. ft. pulv. Dose, sufficient to open the bowels three or four times daily.

Med. Times, Sept. 2, 1865.

1094. *In Intermittent Fevers*, the sulphate of iron was first employed by Dr. Marc, in 1808; and so great was the success which attended its use, that M. Corvisart was appointed to inquire into the practice. His report was most favourable; but, from some unexplained cause, it fell into disuse. My own experience with it, in the malarious fever of Burmah, was decidedly in favour of its antiperiodic power. It was given to the extent of gr. viij.–x. (gr. xx. in obstinate cases) daily in divided doses during the intermissions, either in the form of pill with Ext. Hyoscyami, or in solution with infusion of quassia. It proved most successful in anæmic subjects, and in those with evident enlargement of the spleen. A low diet, with avoidance of all acids and acidulous fruits, and careful regulation of the bowels, were found a necessary part of the treatment. It sometimes succeeded when quinine had previously failed; it seems well worthy of further trials, especially amongst the natives and residents in low malarious localities. *In Intermittent Hemicrania and other Neuralgias*, under the same circumstances, it merits attention. In one obstinate case in my own practice in Burmah, it afforded immediate relief when quinine had failed.

1095. *In Erysipelas*, Velpeau employed the sulphate in solution (℥j., Aq. Oj.) as an external application, in forty cases. In every instance, the active symptoms were subdued in from twenty-four to forty-eight hours. Erratic erysipelas, however, often resisted its action. He also employed an ointment (℥ij., Lard ℥j.) but it was not so efficacious as the solution.

1096. *To Chancres, and Venereal Ulcers*, the sulphate very finely powdered, and sprinkled over the surface, has been employed, as a means of destroying the syphilitic character of the ulceration, and of establishing a healthy surface.

1097. *In the Chronic stages of Hooping-cough*, or when the disease was of a purely nervous character, Dr. Stanger found the sulphate very effectual.

1098. FERRUM TARTARATUM. Tartarated Iron.

Med. Prop. and Action. Tonic and diuretic, anthelmintic in large doses. It is a mild and efficient salt with a very slight taste, and is well adapted for children. It may be prescribed with alkalies.

Dose:—gr. v.–x.

1099. *Therapeutic Uses. In Dropsy and Anasarca*, Dr. Darwell states that he found this salt very efficacious, acting at the same time as a tonic and diuretic. It affords a great amount of relief, he adds, in those cases of anasarca which are connected with disturbed action of the heart, and in which it would be dangerous to give any stimulating tonic.

1100. *In Chronic Diarrhœa attended with Anœmia*, Dr. E. Goodeve (i. p. 100) has found benefit from the following:—℞ Ferri Tart. gr. v.–x., T. Opii ♏x.–xx., Aq. Cinnam. ℥x. To be taken thrice daily.

1101. *Indolent Syphilitic Ulcers* often speedily improve under the use of a lotion of tartarated iron (gr. x.–xxx., ad Aq. ℥j.) *In Syphilitic and Mercurial Cachexia* it may also be advantageously

given internally, either alone or conjoined with iodide of potassium. *In Phagedænic Ulcerations*, the tartrate, used both locally and internally, has often an excellent effect. (Hill and Cooper.)

1102. *For Indolent Ulcers*, Dr. Whitson[1] says that one of the best applications is the potassio-tartrate of iron, as it acts constitutionally as well as locally, and may be used of several degrees of strength, *e.g.*, from grs. x. to grs. xxx. to the ounce of water.

1103. Ferri Vinum. Wine of Iron. Steel Wine.

Med. Prop. and Action. A very useful, mild chalybeate, particularly adapted for children, and for those whose stomachs are irritable.

Dose, ʒj.–ʒiv.

1104. *Therapeutic Uses. In Chlorosis, Amenorrhœa*, &c., occurring in young anæmic women, steel wine is a popular remedy, and one which is occasionally productive of much benefit. Pil. aloes c. myrrh. may advantageously be given at the same time, and generous living and outdoor exercise enjoined. *In Atonic Dysmenorrhœa*, the following formula, advised by Sir C. Locock, is productive of great benefit; I have often employed it with manifest advantage:—℞ Vin. Ferri, Spt. Æther., Sulph. Co. āā fʒj., Mist. Camph. fʒvj. ʒjss to be taken every six hours.

1105. *In Phthisis*, steel wine is favourably spoken of by Dr. Cotton; he found it produce very good results, especially in children and young persons. He places much faith in its use, particularly when given with or immediately after meals.

1106. *In Rickets*, it is, according to Sir W. Jenner, the best form of administering iron. ℞ Vin. Ferri fʒj.–ʒij., Quininæ Sulph. gr. j., Acid. Sulph. dil. ♏j.–ij. M. This forms one of the best mixtures in such cases. It is especially useful when the skin is flabby, covered with perspiration, and when anæmia is well marked. (Dr. Aitken.)[2]

1107. *In Eczema*, Mr. Milton reports very highly of this and other preparations of iron, given in large and long-continued doses. It is chiefly adapted for cases occurring in adults, and when anæmia is present.

1108. Filix Mas. Male Fern. The dried rhizome with the bases of the foot stalks, and portions of the root fibres of Aspidium Filix Mas.

Med. Prop. and Action. Anthelmintic. It contains *a volatile oil, a resin*, and *a fixed oil.* The Ethereal Extract (Extractum Filicis Liquidum) commonly known as the *Oil of Male Fern* (Oleum Filicis Maris), is an oleo-resin containing the volatile and fixed oil, and the resin in solution. Male Fern appears to act specifically on tænia, or tape worms, as they are mostly discharged dead, after the medicine has been taken as directed below.

Dose:—Of Powdered Rhizome, gr. lx.–gr. clxxx.; *of the Liquid Extract*, xv.–xxx., in the form of electuary or emulsion.

1109. *Therapeutic Uses.* Against *Tape Worms*, the rhizome of the Aspidium was employed by the ancients; but it fell into

[1] Practitioner, Jan. 1883.

[2] Reynolds' Syst. of Med. i. p. 808.

disuse until about the middle of the eighteenth century, when Madame Nouffler obtained great celebrity by her nostrum, the base of which was found to be the rhizome of this fern. After the employment of an enema, she gave ʒiij. of the powdered root, followed in two hours by a strong purgative. The practice was doubtless very efficacious. It is, at the present day, generally administered in the form of the liquid extract (Oil of Male Fern). Of this ʒj. should be taken in the morning fasting, and should be followed by a dose of castor oil. It is one of the most effectual remedies we possess. According to Dieterich[1] the operation of the oleo-resin is rendered more speedy and effectual by being conjoined with castor oil (one of the former to two of the latter), as its taste is unpleasant it may be given in capsules. The dry ethereal extract was employed by Brera and Ebers in doses of gr. xij.–gr. xxiv. at night, and repeated in the morning ; but it does not seem to possess any advantage over the liquid extract. The worms are generally discharged dead. Dr. Fleming considers that the oil should be given fasting, in a draught of milk, the favourite food of the parasite.

1110. *Hydatids.* Dr. Pavy[2] records an interesting case of *Hydatid Tumour of the Liver*, treated by injection into the cyst, after evacuating its contents, of a liquid containing ℥xxx. of the purified extract of male fern, ℥xxx. of liq. potassæ, and ʒvj. of water, care being taken to prevent the entrance of air. Some febrile excitement, vomiting and purging followed, but no peritonitis. Recovery ensued. The inference drawn from this case is, "that the injection of the extract of male fern caused an immediate destruction of the life of the hydatid, without the production of suppuration, and that a rapid absorption of the fluid element of the cyst afterwards took place."

FRANGULA. See RHAMNUS FRANGULA.

1111. GALBANUM. A gum-resin of Ferula galbaniflua.

Med. Prop. and Action. Stimulant, antispasmodic, and expectorant. As an antispasmodic, it is inferior to assafœtida, and may be ranked between it and ammoniacum. It is regarded as emmenagogue, and may be advantageously combined with the salts of iron in the treatment of *Amenorrhœa.* Externally applied in the form of plaster (Galbanum ʒj., Ammoniac ʒj., Yellow Wax ʒj., Litharge Plaster ʒviij.) it is discutient and stimulant.

Dose:—Of Galbanum, gr. x.–gr. xx. in pill or emulsion. It forms an important ingredient in Pil. Assafœtidæ Co., which is an eligible form of administration.

1112. *Therapeutic Uses.* Similar to those of ammoniacum (*q.v.*)

1113. *To Indolent Tumours of a non-malignant character*, galbanum plaster is sometimes applied, with the effect of diminishing their size, or altogether causing their absorption. This plaster proves useful to *Chronic Arthritic Enlargements*, when, in addition to support, it is desired to establish some degree of irritation.

1114. *In Dysmenorrhœa*, especially when associated with

[1] Lond. Med. Record Nov. 15, 1882. [2] Lancet, Sept. 1, 1866

Hysteria, a galbanum plaster to the loins is often attended with good effects.

1115. GALLA. Galls.

Med. Prop. and Action. Astringent. Their astringency depends upon the presence of tannic and gallic acids; of the former they contain 35, of the latter 5 per cent. They are used as an antidote in *Poisoning by Ipecacuanha, Emetine, the alkaloids generally*, and those vegetable productions whose activity depends upon an alkaloid, as *Opium, Aconite*, &c. They are also said to be an antidote in *Poisoning by Tartar Emetic*, but this appears doubtful. They may be given in infusion (ʒj., Aq. Ferv. ʒxij.) Externally they are used in the form of ointment.

Dose of the Tincture:—ʒss.-ij. Prep. for external use:—Ung. Gallæ, and Ung. Gallæ c. Opio.

1116. *Therapeutic Uses. In Chronic Diarrhœa* and *the later stages of Dysentery*, in *Leucorrhœa*, in *Chronic Gonorrhœa* or *Gleet*, and in *Intermittent Fevers*, especially those of the natives of India, galls have been recommended by good authorities, but as an internal remedy they have been superseded by tannic and gallic acids, which are alike pleasanter to take, as well as more efficient, than the crude drug.

1117. *In Prolapsus Uteri vel Recti*, the daily use of an enema of decoction of galls proves serviceable in astringing the parts. *In Hœmorrhoids*, one of the most popular and efficacious external applications is Ung. Gallæ c. Opio. The Confect. Pip. Nig. may be advantageously given internally at the same time.

1118. *In Relaxation of the Uvula, and Hypertrophy of the Tonsils*, an efficient astringent gargle is composed of gr. lx. of alum in ʒvj. of infusion of galls.

1119. GALLIC ACID. Acidum Gallicum. A crystalline acid prepared from galls.

Med. Prop. and Action. Powerful astringent. According to Dr. Bence Jones,[1] both gallic and tannic acids are strongly deoxidizing agents; so much so, that when in contact with alkalies, as in the blood, they are capable of taking oxygen even from the corpuscles. This may serve, in a degree, to explain their action; they have probably no effect on the nerves or muscles, exciting no contraction of the muscular structure. Gallic acid has a tendency to produce constipation, which may be obviated by an occasional aperient. It produces no sensible effect on the system, even in considerable doses. It passes unchanged into the urine, and has been detected an hour after it has been taken. (Parkes.) Its properties are very similar to those of tannic acid, but it is weaker, probably from its inferior solubility. Dr. Garrod, however, considers that, as a remote astringent, it is more effectual than an equal quantity of tannic acid, for the latter becomes converted in the blood into gallic acid and grape sugar, and hence, part only is available. It is said to be the active ingredient in Ruspini's styptic.

Dose, gr. ij.–gr. x. It is best given rolled up in wafer paper or in the syrup of preserved ginger (Dr. West.) Prep. for external use:—Glycerine of Gallic Acid.

1120. *Therapeutic Uses. In Hœmorrhagic Diseases*, gallic acid is a valuable remedy, but it is adapted only for chronic cases, or the advanced stage of acute cases, when inflammatory symptoms have been subdued. Its efficacy appears to be increased by combination

[1] Med. Times, Sept. 1866.

with sulphuric acid, and may often be advantageously conjoined with opium, digitalis, and other remedies of the same class. The following, advised by Dr. L. Earle, is a useful formula:—℞ Acid. Gallic. gr. xxx., Acid. Sulph. dil. fʒj., Liq. Opii Sed. ♏xxx., Infus. Rosæ Co. fʒvj. M. ʒj. every three or four hours. *In Hæmoptysis*, this mixture acts beneficially; but in *Tubercular Hæmoptysis*, Dr. Symonds[1] considers larger doses necessary; thus, in severe cases, he prescribes gr. xx. every hour for twelve hours, and then at longer intervals. Dr. Holden[2] obtained the best results by applying the spray of a saturated solution of gallic acid directly into the mouth and throat. Even in cases of profuse hæmorrhage it proved effectual. *In Hæmorrhage from the Bowels in Typhoid Fever*, Sir W. Jenner[3] advises grs. xv. of gallic acid, gutt. iii.–v. of laudanum every two or three hours in a wineglass of iced water. (See Opium.) *In Hæmorrhage connected with Ulcer of the Stomach*, Dr. Brinton (p. 176) advises the following formula:—℞ Acid. Gallic. gr. x., Acid. Sulph. dil, ♏x., Aq. ʒj. M. This is well adapted for other forms of *Chronic Hæmatemesis* and *Hæmaturia*. *In Atonic Menorrhagia* its use is often attended with the best effects. Sir J. Y. Simpson gave it in doses of 10, 15, or 20 grains daily, and continued its use during the intervals as well as at the period of the discharge. According to Dr. West (p. 64) it is most useful in the menorrhagia of young unmarried women or of anæmic subjects. In doses of grs. vj.–viij. he states that it failed him least often of all astringents in *Hæmorrhage arising from Cancer of the Uterus*. Although doubtless a valuable astringent in these cases, it often, as Dr. Tilt observes, fails, especially when the hæmorrhage depends upon organic lesions. As a topical agent it is inferior to tannic acid.

1121. *In Phthisis*, gallic acid with sulphuric acid sometimes proves very effectual in checking the *Profuse Perspirations* and *Excessive Expectoration*. It likewise acts beneficially in checking *the Diarrhœa* of this disease.

1122. *In Albuminuria*, gallic acid has been recommended, but it failed entirely in the hands of Dr. Roberts (Syst. v. p. 525), who cites the experience of Dr. Parkes to the same effect. *In Scarlatinal Albuminuria* it sometimes succeeds when the perchloride of iron and other remedies have failed according to Dr. Gee (Syst. i. p. 357), and some cases successfully treated with it are recorded by Dr. J. T. Jamieson.[4]

1123. *In Pyrosis*, unaccompanied by organic disease of the stomach or by disease of the liver, the most marked benefit, according to Dr. Bayes, follows the use of gallic acid. *In Chronic Diarrhœa and Gastric Irritation in children*, Dr. Hillier (p. 386) furnishes the following excellent formula: ℞ Acid. Gallic. gr. xij., T. Cinnam. Co. ♏lxxx., T. Opii ♏viij., Aq. Carui ad ʒij. M. Dose, two teaspoonfuls for a child aged two years. In these cases, Dr. West (p. 609) advises a very similar mixture, and states that he has used with good effect a combination of gallic acid and laudanum, in the form of enema.

[1] Brit. Med. Journ. June 13, 1868.
[2] Practitioner, Feb. 1872.
[3] Lancet, Nov. 15. 1880.
[4] Med. Press, Feb. 2, 1876.

1124. Gelsemium. Yellow Jasmine. Gelsemine.

Med. Prop. and Action. The root of Gelsemium sempervirens is used for preparation of a tincture (B.P. 1885), an alcoholic extract (B.P. 1885), and the alkaloid Gelsemina or Gelsemine. It has been used as a nervine sedative and as a febrifuge.

Physiological action. Moritz[1] found gelsemine caused in warm-blooded animals an initial excitement followed by depression which culminated in paralysis alike of brain and spinal cord. In cold-blooded animals a peculiar tremor was noted which Moritz believes is due to interference with the spinal centres. Drs. Ringer[2] and Murrell corroborate these results. They find the convulsions and paralysis which appear, are due probably neither to cerebral nor to peripheral causes. These phenomena, so opposite in character, are explicable, it is believed, by the presence of two substances, one acting as the tetanizer, the other as a paralyzer. It would appear that the action of gelsemine is exerted upon the motor portion of the spinal cord. Dr. Bartholow[3] holds that the sensory portion of the cord is also affected, and thus complete anæsthesia eventually appears. Upon respiration, gelsemine exercises marked effects. At first it increases the depth, but not the rate of respiration. In the end it slows and shallows the breathing, finally killing by paralysis of the respiratory muscles.[4] Gelsemine slows the heart, and does so even after section of the cardiac nerves and spinal cord. It also reduces arterial pressure and lessens pulse rate. Gelsemine used locally dilates the pupils[5] and paralyses accommodation; while taken internally it contracts the pupils. Diplopia and ptosis are also provoked by the alkaloid. The muscular system both in cold- and warm-blooded animals is powerfully affected; complete muscular paralysis following upon large doses of gelsemium. The susceptibility of individuals to the drug varies greatly, some persons evincing alarming symptoms of poisoning upon the use of very small doses. The preparations of gelsemium were first introduced into the British Pharmacopœia in 1885. Ziemssen[6] recommends for hypodermic injection a solution of 1 in 200 of the Hydrochlorate of gelsemine.

Dose:—Alcoholic extract, gr. ss.–ij. *Tincture*, ♏v.–xx.

Poisoning by Gelsemium shows the following symptoms. Prostration, muscular weakness and inco-ordination. The eyelids drop, the lower jaw falls, the tongue lolls powerless in the mouth. The larynx and pharynx show signs of spasm (Stillé and Maisch). The respiration grows slower, and at length ceases. The mind in most cases remains clear. The pupils are widely dilated (Wood), while an internal squint usually is present. The treatment resolves itself into the use of emetics, external friction, with the introduction of morphine. Coffee, ammonia and alcohol should also be given.

1125. *Therapeutic Uses. Neuralgia. Dental Neuralgia* is often eased. Large doses are needed, and Dr. Ringer observes that they may produce dizziness, haziness of vision, and desire for sleep—symptoms of which it is better to warn the patient beforehand. Dr. Massini[7] finds ♏xx. of the tincture every half-hour for three doses almost invariably cures *Trigeminal Neuralgia*. Most authorities seem to agree that gelsemium is far more efficacious in curing *Neuralgia* of the first and second branches of the fifth nerve than that of the third. In the last cases many state it fails completely.

1126. *Asthma, Spasmodic Laryngitis, Hooping-cough*, are, according to Dr. Bartholow, relieved by gelsemium.

[1] Archiv f. Path. u. Physiol. xii. 299.
[2] Handbk. Therap. 9th ed.
[3] Practitioner, v.
[4] Burdon Sanderson, Ringer and Murrell (*op. cit.*)
[5] Ringer, Murrell (*op. cit.*), also Lancet, 1877, i. p. 833.
[6] Handbk. of General Therapeutics, p. 470.
[7] Practitioner, July 1879.

1127. *Nervous irritable Cough*, due to "excessive excitability of the respiratory centre" (Ringer), yields to this remedy.

1128. *In Ovarian Neuralgia*, Gelsemium deserves a trial. Its power is great but not certain.

1129. *Obstructed Labours*, due to *Rigidity of the Os uteri*, are said by Dr. Davis [1] and others to be remedied by gelsemium; it relaxes the spasm, and so speedily completes parturition. In non-puerperal cases it is said to provoke dilatation of the os uteri.

1130. *In cases of Intercostal Neuralgia* this drug as often fails as not.

1131. *Traumatic Tetanus.* Various cases have been reported [2] in which gelsemium has been accredited with effecting a cure. Dr. Read, of Alabama, gave ℥xx. of the fl. extract (N.Y. Ph.) every two hours, rapidly increasing the dose to ℥xl.; a complete recovery ensued.

1132. The *Itching of Chronic Eczema* is, says Dr. Bulkley,[3] relieved by giving ℥x. doses of the tincture every half-hour until the symptom has passed off.

1133. *In Ophthalmic Surgery*, Mr. John Tweedy [4] uses drops of gelsemine (gr. viij. to ʒj.) every quarter of an hour for an hour, and then every half-hour for two succeeding hours. The mydriasis passes off rapidly. Prof. Wood [5] cautions against a too free use of these drops, lest if absorption takes place a general toxic effect should occur.

1134. Gentianæ Radix. The root of Gentiana lutea.

Med. Prop. and Action. A pure bitter tonic. Its activity depends upon a bitter principle, *Gentianite*. It also contains a crystallizable principle, *Gentianin*. Gentian acts without causing astringency (indeed, it has occasionally a laxative effect); neither is it a stimulant; but, taken in moderate doses, it increases the tone of the digestion, improves the appetite, and strengthens the constitution. By long-continued use, it is said to communicate a bitter taste to the urine and cutaneous secretion. It has been asserted that it exercises a specific influence on the cerebro-spinal system, occasionally producing poisonous effects; but I have given it largely for several years, and have never observed any ill effects result even from its long-continued use. Dr. Aveling proposed the use of gentian root in the manufacture of tents, in treating *partial occlusion of the cervix uteri*. He speaks of them as cheap, simple and efficacious.

1135. *Therapeutic Uses. In Debility, and Diseases accompanied by Debility*, gentian is one of the most generally useful of the bitter tonics. It may be advantageously combined with the carbonate or aromatic spirit of ammonia.

1136. *In Atonic Dyspepsia and in the Dyspepsia of Gouty subjects* the tincture, given in some aromatic water, is very valuable as a stomachic and tonic. It may be advantageously combined with alkalies and sedatives.

Glonoin. See Nitro-Glycerin.

[1] Journ. Amer. Med. Ass. ii.
[2] Brit. Med. Journ. 1882, ii. 1883, i., see also Boston Med. Journ. 1869.
[3] New York Med. Journ. Jan. 1881.
[4] Lancet, 1877, p. 832.
[5] Therap. 5th ed. 372.

1137. Glycerinum. Glycerine.

Med. Prop. and Action. Valuable emollient. Taken internally in small and long-continued doses its action is that of a nutrient, increasing the weight of the body, stimulating the digestive functions, and assisting the assimilative process, and diminishing the excretion of urea. It is, however, as a local or external agent that it is principally employed, and for this purpose it possesses special qualifications. It not only softens the surface to which it is applied more rapidly than any other agent of the same class, but from its non-volatility, and hygroscopic properties, it gives a persistency to its action which is often very advantageous. (Wood.) Another great advantage pertaining to it pointed out by M. Vigier,[1] is that poisonous agents, incorporated with it, may be applied fairly to the skin without the fear of their becoming absorbed into the system. Indeed, the glycerine seems to prevent any such absorption taking place; this Vigier considers to be due to its not wetting the skin; be that as it may, it imparts to glycerine a great superiority over other menstrua when a purely local action is desired. Its hydragogue action when applied to mucous membranes is very remarkable. This was first pointed out by Dr. Lombe Atthill,[2] he found that if a pledget of cotton wool saturated with glycerine were left in contact with the vaginal and uterine surfaces for 12 or 24 hours, its removal was followed by a copious watery discharge, so copious indeed that the patient might be alarmed by it unless informed beforehand that it would occur, the membranes themselves being pale and relaxed. A mixture of 1 part of glycerine and 4 of gelatine is spoken of highly by Dr. A. Meadows[3] as a basis for medicated pessaries. It makes, he states, an admirable mass which easily melts at the temperature of the vagina, and any ingredient that is not astringent can be added to it, but as all astringents combine with the gelatine and form insoluble compounds, they cannot be used. Being a ready solvent of the alkaloids it is much in use in preparing them, with water, &c., for hypodermic injection. It is most serviceable for disguising the taste of nauseous medicines in place of syrup, which, in some cases, especially in stomach affections of children, is very objectionable. As a substitute for lard in preparing ointments its value is universally recognized. Its stickiness is its chief disadvantage. Some people are intolerant of its action, its application being followed by great irritation. It possesses powerful antiseptic properties, meat preserved in it remains good and eatable for months, and vegetable substances likewise for six or eight weeks, according to B. Wilmot.

Preparations. There are eight officinal Glycerines in the B. P. 1885:—Glycerin. Acid. Carbolic.; Glycerin. Acid. Gallic.; Glycerin. Acid. Tannic.; Glycerin. Aluminis [1885]; Glycerin. Amyli; Glycerin. Boracis; Glycerin. Plumbi Subacetat. [1885]; Glycerin. Tragacanthæ [1885].

Dose, ʒj.-ij.

1138. *Therapeutic Uses.* *In Skin Diseases* glycerine is a most valuable remedy, but in its pure state it is too irritating for general use; to obtain its emollient effect it requires to be freely diluted. It was first brought to notice in this class of cases in 1845, by the late Mr. Startin, who employed the annexed formulæ with great success. For *Superficial Burns, Scalds, Excoriations, Intertrigo, and Herpes Labiorum,* ℞ Gum. Trag. Pur. ʒij.–ʒiv., Liq. Calcis fʒiv., Glycerini fʒj., Aq. Rosæ ʒiij. M. To form a soft jelly, to be used as ointment or embrocation. For *Chapped or Sore Nipples, Chapped Hands, Fissures of the Lips, and Pityriasis,* ℞ Sodæ Bibor. ʒss.-j., Glycerini fʒss., Aq. Rosæ ʒvijss. M. For *Prurigo, Lichen, Strophulus, Lepra, and Psoriasis,* ℞ Acid. Nit. Dil. fʒss.–fʒj., Bismuth. Subnit. ʒss., T. Digitalis fʒj., Glycerini fʒss., Aq. Rosæ ʒvij. M. To be applied to the affected parts frequently. For

[1] Med. Press, Feb. 14, 1883.
[2] Med. Press, Dec. 31, 1873.
[3] Lancet, May 10, 1873.

Alopecia, Baldness, Dryness of the Scalp, and the Loss of Hair after debilitating diseases, ℞ Spt. Ammon. Co. f℥j., Glycerini f℥ss., T. Cantharidis f℥j.–f℥ij., Aq. Rosmar. ℥viij. M. Five parts of glycerine rubbed up in a mortar with four parts by weight of yolk of egg, forms a compound which has the consistence of honey, and is unctuous like fatty substances, but possessing the advantage of being easily removed by water. Applied to the skin, it forms a varnish which effectually prevents the action of air. These properties render it serviceable for *Broken Surfaces of all kinds*, *Bed Sores*, *Erysipelas*, *and Sore Nipples and for Cutaneous Affections*, the irritation of which it allays.

1139. *In Small-pox, to prevent pitting and local disfigurement*, glycerine proves of great service by its emollient properties. After the pustules have emptied, and the discharge has begun to dry, a mixture of one part of glycerine and two parts of rose water may be freely applied for a few days until the scabs begin to loosen.

1140. *In Chronic Uterine Affections*, Dr. Fürst, of Franzenbad, recommends the local application of glycerine by means of the tampon. Cotton-wool boiled quite clean is tied up into a tampon with pack-thread, and is then moistened in hot water and wrung out, from ℥ss.–j. of glycerine is then placed upon it, and the tampon is introduced into the vagina at bedtime. Not only in *Hypertrophy of the Uterus*, but in *Endometritis* and *Vaginitis* he found it serviceable. In speaking of *Uterine Congestion*, Dr. Playfair[1] remarks that no agent is so useful as the nightly application of a tampon of cotton-wool well soaked in glycerine, "an invaluable addition to our resources in the treatment of uterine disease, and one which has the advantage of being capable of being employed by the patient herself." *In Inflammatory Thickening of the Cervix Uteri*, Dr. Priestley (Syst. v. p. 739), observes that glycerine used alone seems to act as a local hydragogue, and thus to promote the subsidence of the swollen tissues. See also Dr. Atthill in section 1138, *ante*.

1141. *In Phthisis*, glycerine has been proposed as a substitute for cod-liver oil, and in some cases it has appeared to answer well. Dr. Cotton, however, states that he gave it a fair trial in twenty-three cases. He administered ℥j.–ij., and even ℥iij., twice daily, and from this experience he draws the following conclusions:—1. That it has generally little influence in phthisical cases; and 2. That it will bear no comparison with cod-liver oil. For the relief of the *Cough* a teaspoonful with a little lemon-juice is very serviceable, as also are "glycerine jujubes." As a substitute for cod-liver oil Dr. Lamande[2] advises the following:—Tr. Iodi gutt. xxx., Potass. Iod. gr. v., Glycerini (by weight) ℥ixss. Dose, a tablespoonful, a quarter of an hour before each meal.

1142. *In Croup*, Dr. Mayer speaks favourably of the value of glycerine locally applied to the glottis, as an adjunct to other treatment. Its application in the form of spray inhalation, by

1 Brit. Med. Journ. March 27, 1880. 2 Glasgow Med. Journ. June 1880.

means of Siegle's apparatus, repeated at intervals of ½ to 1½ hour for fifteen minutes at a time is strongly recommended by Dr. Stehberger[1] of Mannheim. He was led to its use from observing its good effect in *Hoarseness* and *Aphonia*.

1143. *In Hæmorrhoids*, especially in the internal forms, glycerine taken internally in doses of ʒj.–ʒiij. in a wineglassful of water morning and evening, affords marked, and sometimes permanent, relief, according to Dr. D. Young,[2] Mr. W. H. Jelland[3] and others. Dr. Soper[4] employs a mixture of glycerine and castor oil for the relief of habitual constipation in the anæmic.

1144. *In Acidity of the Stomach, Flatulence and Pyrosis*, Drs. Ringer and Murrell,[5] found glycerine speedily and completely successful in some cases where the ordinary remedies had failed. They gave it in doses of ʒj.–ʒij. either before, with, or immediately after food, either in water, coffee, tea, or lemon and soda water. In tea and coffee, they observe it may replace sugar, a substance which greatly favours flatulence, as indeed, does tea in many cases.

1145. *In Diabetes* it has been highly commended;[6] but Dr. W. Wood (p. 599) justly observes there is no reason to believe that it exerts any influence over the disease. It may, however, be advantageously used for sweetening tea, coffee, &c., for diabetic patients.

1146. *In Deafness*, glycerine was brought forward as a remedy, It has no claims as a curative agent, but where the auditory canal is dry and inelastic, and the natural secretion deficient, the introduction of a few drops of glycerine, either in a fluid form or on a piece of cotton, has the effect of improving the hearing for a time.

1447. Goa Powder [Chrysarobinum].

Called Goa Powder from the East Indian Portuguese settlement, Goa, whence it was long since imported from Brazil, under the name of Araroba, or Po' de Bahia, as a valuable remedy in *Skin diseases*, especially *Psoriasis*. It occurs in the form of a rough, yellowish or brownish powder, the result of metamorphosis of the contents of the cells of the heartwood of a large leguminous tree, Andiva araroba, *Aguiar*, inhabiting the forests of Bahia, in Brazil. From the high repute it acquired amongst the natives of India, it attracted the attention of Sir J. Fayrer, who, in 1874, brought it to the notice of the profession in Europe. Analysis by Professor Attfield showed that it contains about 80 per cent. of chrysarobin, which, under the influence of moist air and alkalies, decomposes and forms chrysophanic acid: the latter (*q.v.*) has now quite superseded the crude drug in practice, but whether with advantage or not there is no comparative evidence to show. The Indian mode of applying the remedy consists in dipping the cut half of a lime fruit in the powder, and with this moistening the

[1] Brit. Med. Journ. Jan. 14, 1871.
[2] Practitioner, Jan. 1878 and Oct. 1879.
[3] Brit. Med. Journ. June 29, 1878.
[4] Lancet, 1883.
[5] Lancet, July 3, 1880.
[6] Ziemssen's Encyclop. xvi.

affected surface. Care should be taken in powdering the crude drug, or violent inflammation of the eyes and mucous membrane of the nose may result.[1]

Goa powder was introduced into the British Pharmacopeia of 1885 under the name of Chrysarobinum, and the ointment (1 part in 24 benzoated lard) made officinal.

1148. *Therapeutic Uses.* See Chrysophanic Acid.

Granati Radix. Pomegranate Root. See Punica Granatum.

1149. Grindelia Robusta. The Gum Plant.

Med. Prop. and Uses. According to Rademaker[2] Grindelia owes its powers to a bitter principle, a resin, a volatile oil, and other bodies. The dried herb has long enjoyed a reputation as a specific against asthma.

There are two extracts commonly in use, the alcoholic extract recommended by Dr. Ringer in gr. ij.–iij. doses in pill with lycopodium three times a day; and a liquid extract, officinal in the U. S. Pharmacopœia, the dose of which is ♏x.–℥j. Grindelia preparations have a pungent taste, giving a sensation of heat to the stomach. In very large doses they produce a species of hypnotism. Bartholow describes the action of Grindelia as tonic in small doses, promoting digestion. In larger quantities it provokes gastric irritation. The rhythm of the heart and respiration are slowed. Upon the nervous system the effects are —dilatation of the pupils, impairment of sensation, decreased reflexes, and finally hypnotism. Death results from paralysis of respiration. The elimination takes place from the renal and pulmonary mucous membranes.

1150. *Therapeutic Uses. Asthma.* Long known in California as a specific, its merits have met with but scant recognition in this country. It is well spoken of by Ringer and Murrell, and by Bartholow of Philadelphia. It answers either to give gr. iij. doses of the extract to avert the attack, or to cut it short by giving ♏xx. to ♏xxx. of a liquid extract every half-hour or hour, beginning at the very onset of the attack (Ringer), or as a fumigation. To effect this, the plant is steeped in saturated solution of nitre, and then dried. The patient inhales fumes after igniting the plant. Bartholow finds this plan efficacious.

1151. *Hooping-cough* and *Spasmodic Cough* in general yield to Grindelia. In the distressing form of *dyspnœa* with *suffocating cough*, which occurs in *Emphysema*, with or without *Bronchitis*, this remedy is of great service.

1152. *Bronchitis, Bronchorrhœa,* and *Hay Asthma* will, Dr. Bartholow says, yield to grindelia, even when other remedies have failed.

1153. *Inflammatory conditions of the Urinary passages, Catarrh of the Bladder,* &c., are reputed to be benefited by it.

1154. *For Burns and Blisters,* Grindelia has further been employed as a dressing, and is reputed to relieve the pain of *Herpes zoster* (Stillé). In America it is used as an antidote, and applied topically in *Poisoning by Rhus toxicodendron.*

[1] Midl. Med. Misc. Oct. 1883. [2] Louisville Med. News.

1155. Guaiaci Lignum et Resina. The Wood and the Resin of Guaiacum officinale.

Med. Prop. and Action. Both the wood and resin are stimulant, diaphoretic, alterative, and tonic. The wood is best given in decoction in doses Oss.–Oj. daily. The resin, the part most commonly employed, may be given in the form of mixture, but a better form is the Ammoniated Tincture. Guaiacum acts by augmenting the action of the cutaneous capillaries, thereby improving the state of the cuticular function. To obtain its diaphoretic effect, the surface of the body should be kept warm, tepid diluents should be drunk plentifully, care should be taken that the resin is in a state of minute division, and it should be combined with opium. If it fail to produce diaphoresis. it acts as a diuretic. In small medicinal doses, gr. x.–xxx. of the resin, it causes a pleasant sensation of warmth in the stomach, and dryness of the mouth and fauces, and, by proper management, profuse diaphoresis. In larger doses it purges; the heat of the stomach and dryness of the mouth become intense, and, if continued, would produce gastro-intestinal inflammation. It appears to have great power in lessening excessive secretion from mucous surfaces.

Dose:—Of the Resin, gr. x.–xxx. in bolus or emulsion. *Of the Mixture*, fʒss.–ij. Each fluid ounce contains gr. xj. of the resin. *Of the Ammoniated Tincture* fʒss.–j. in emulsion.

1156. *Therapeutic Uses. In Amenorrhœa*, Dr. Dewees places more confidence in the ammoniated tincture than in any other remedy. His statements, however, have not been confirmed by others. The resin in substance, in 10-grain doses daily, is very favourably reported of by Professor Cleland.[1] *In Dysmenorrhœa*, Dr. Dewees also strongly advocated the ammoniated tincture, and Dr. Rigby states that where this affection partook of a rheumatic character, he derived great benefit from the use of guaiacum. In atonic cases, Dr. Graily Hewitt (p. 443) advises guaiacum to be given with magnesia (āā gr. x.) in powder every morning. He also states (p. 365) that he has found it useful in *Chronic Inflammation and Irritable States of the Uterus*, when there is an undue quantity of discharge present.

1157. *In Ovarian Affections*, the effect of the resin (gr. x. daily) according to Dr. Cleland (*op. cit.*), are often very remarkable. He found it useless, however, in acute cases, and in those in which the primary disorder was situated, not in the ovary but in the uterus.

1158. *In Chronic Rheumatism*, guaiacum has, since the time of Dr. Dawson in 1781, maintained its character as a valuable remedy. Some practitioners prescribe as much as ʒvj., but smaller doses, ʒij., of the ammoniated tincture are best. In some forms of *Neuralgia*, when partaking of a rheumatic character, the ammoniated tincture (ɱxx.–xl. every four hours) affords relief.

1159. *In Gout*, guaiacum has long enjoyed a high repute in Germany. Dr. Garrod states that he has used it extensively and with great advantage; he considers that it is especially useful in the asthenic gout of old subjects, but that also to young patients it may be given with benefit. It may be administered for a long

[1] Irish Hosp. Gaz. June 1, 1873.

period without injury, some of Dr. Garrod's patients having taken it for a whole year.

1160. *In Cynanche Tonsillaris*, Mr. J. Bell strongly recommends the internal use of guaiacum, in half-drachm doses, suspended in mucilage, every six hours. He considers that, when timely administered, it will cut short the disease 99 times out of 100. Dr. F. P. Atkinson,[1] Dr. Walker,[2] and others have borne strong testimony to its value. Dr. Morell Mackenzie (p. 57) considers that in cases of *deep Tonsillitis* we possess in guaiacum a remedy which, if administered at the outset of the attack, will almost always cut short the inflammation. He prefers it in the solid form: taken as a lozenge, he says, it seems to have a local as well as a constitutional effect. "A lozenge containing three grains of the resin will seldom fail to arrest the disease at its first outset." (p. 57.)

1161. GYNOCARDIÆ OLEUM. Chaulmugra Oil.

Med. Prop. and Uses. The expressed oil of Gynocardia odorata is what has long been known as Chaulmugra oil. In India the natives have had recourse to this oil for centuries. It was first introduced to the profession by Dr. Mouat, of the Bengal Medical Service. The great drawback to its use has been the amount of adulteration to which it has been subjected. The oil is solid, of a light brown colour, disagreeable alike to taste and smell. It readily melts. It contains palmitic and other fatty acids, while its activity seems to reside in a constituent called Gynocardic acid.

1162. *Therapeutic Uses. Externally. In Macular Leprosy, Anæsthetic Leprosy*, and *Tubercular Leprosy*, Dr. Young [3] employed a liniment of chaulmugra oil mixed with Psoralea corylifolia, but administered the oil also internally.

1163. *Chronic Rheumatism* and *Gout*. The ointment (*infra*) with friction proves of use in many, even obstinate, cases.

1164. *Eczema*. In old-standing cases of eczema, chaulmugra oil ointment is often of great benefit. The best ointment is chaulmugra oil 1 part, vaseline 3 parts, or in eczema, the strength may be even greater. The oil is melted at a gentle heat, and kept agitated until quite cool.

1165. *In Phthisis*. The oil is rubbed over the chest, producing, it is said, some increase in weight. However, chaulmugra oil, after some extended trial, must be confessed to have shown itself a very unsatisfactory drug in the treatment of phthisis.

1166. *Internally. Chronic Rheumatism and Gout* have been benefited, it is alleged, by the internal use of chaulmugra oil. It is best given in *perles*, with milk, castor oil, or cod-liver oil, in doses from five to fifteen minims, and always should be exhibited *after* meals.

1167. *In Leprosy, and other Skin Affections*, Dr. Young used it in conjunction with local applications. Mr. Hillis [4] and Mr. Startin both confirm his reports.

1168. *In Elephantiasis Græcorum*, the oil is, according to Dr.

[1] Practitioner, Feb. 1870.
[2] Brit. Med. Journ. Dec. 21, 1861.
[3] Practitioner, vol. xxi.
[4] Brit. Med. Journ. vol. i. 1881.

Liveing, of considerable use. Mr. Startin finds *non-specific Psoriasis* to be benefited by the *perles*.

1169. *Secondary Syphilis and Scrofula.*[1] Chaulmugra oil can, it is said, be usefully employed in these affections.

1170. *Lupus, Scabies, and Ringworm* are also controlled, or at least benefited, by this remedy.

1171. *Phthisis.* Dr. Murrell[2] has employed the oil in a number of cases. He finds it relieves cough, loosens expectoration, and increases patient's sense of well-being. On the other hand, he failed to detect any amelioration of physical signs, or permanent increase of weight. Dr. Murrell thinks the endermic inunction the best mode of application, as the oil if given in milk often nauseates and upsets the stomach. Dr. Burney Yeo reports that but little benefit followed his employment of this oil in phthisis.

1172. *Marasmus.* Dr. Murrell has found marked benefit follow inunctions of chaulmugra oil in *Marasmus*.

1173. *Sciatica, Neuralgia.* Chaulmugra oil is of use in these and kindred affections, but it is doubtful how it acts.

1174. Hæmatoxyli Lignum. Logwood.

Med. Prop. and Action. Astringent and tonic. It contains a crystalline substance, *Hæmatoxyline*, also *tannin*, and a resin. When given internally, it becomes absorbed into the system. The colouring principle has been detected in the urine twenty-five minutes after it has been swallowed. "The urine of patients taking logwood exhibits a pink colour when that fluid becomes alkaline from any cause; in strongly acid urine the colour may not be seen, but the addition of ammonia readily produces the coloration." (Garrod.)

Dose:—Of the Extract, gr. x.–xxx. *Of the Decoction*, ʒj.–ij.

1175. *Therapeutic Uses. In Chronic Diarrhœa and Dysentery*, the decoction or the extract of logwood (gr. x.–xxx.) is productive of evident benefit. It not only acts as an astringent, but gives a tone to the digestive organs, and to the system generally. It is inadmissible as long as active inflammation exists. *In Chronic Diarrhœa, and in the Diarrhœa of Phthisis*, Dr. Pavy testifies to the value of the following:—℞ Mist. Cretæ ʒxij., Ext. Hæmatox. ʒij., Vin. Ipecac. ʒij., Vin. Opii ʒj. M. In doses of ʒss., twice or thrice daily, or oftener. It is a very useful formula. *In the Chronic Diarrhœa and Dysentery of Children*, it often answers well, and may be advantageously prescribed as advised by Dr. Hillier: ℞ Ext. Hæmatox. ʒij., T. Catechu ʒiij., Syrup. ʒj., Aq. Cinnam. ad ʒiij. M. Dose, two teaspoonfuls for a child æt. three years.

1176. *In Leucorrhœa*, the decoction of logwood given internally, and used as a vaginal injection, is occasionally of great service.

1177. Hamamelis Virginica.

Med. Prop. and Action. The bark of Hamamelis Virginica (Witch Hazel) is imported from America, where it is largely used, especially under the proprietary names of Pond's Extract and Hazeline. Although tannic and gallic acids are both present in the bark, yet the quantities of them are too small to produce the very marked astringent effect which is possessed by Hamamelis.

[1] Med. Times and Gaz. 1878. [2] Brit. Med. Journ. 1880, ii. p. 844.

A principle, Hamamelin, is described, and has been employed in medicine in treating piles.

Preparations and Doses:—The tincture (1 in 10) ♏ij.–v.; large doses produce throbbing of the head. An *ointment* of same strength is useful for local application to piles, or a plaster may in the case of varicose veins be beneficially employed.

1178. *Therapeutic Uses. In Hæmorrhages,* hamamelis is especially useful in passive bleedings, in the loss from *Piles*, in *Epistaxis*, in *Hæmoptysis*, and *Hæmatemesis*. Ringer has found it very valuable in the treatment of hæmorrhoids. He recommends ʒj. to ʒiij. of cold water to be injected at bedtime, and to be retained.

1179. *Hæmophilia* is said to be beneficially influenced by the use of hamamelis.

1180. *In Post-partum oozing,* Ringer commends doses of ♏ij. of the tincture to be taken every two or three hours.

1181. *Menorrhagia* is best treated, according to Mr. H. Chute,[1] by ʒss. doses of extract of hamamelis in sugar water twice or thrice daily. He also finds it relieves the pain of *Dysmenorrhœa*. Dr. Heywood Smith[2] speaks favourably of its use in *Hæmorrhage from the female generative passages.*

1182. *In Mucous Discharges,* hamamelis is said to be a most excellent injection, cutting short the attack, and rapidly curing the discharge.

1182*. In treating *Varicose Veins*, plasters made of hamamelis on rubber have been favourably noticed.

1183. HIRUDINES, Leeches, are very commonly employed as agents for local blood-letting. Local blood-letting is mainly employed for the relief of local inflammations and congestions; and in the modern treatment of disease is employed in most cases where venesection would have been formerly used. Cupping is preferable to leeches—1, when we desire to draw blood rapidly; 2, when we desire accurately to ascertain the quantity of blood drawn; 3, when it is desirable to make an impression on the system.

1184. *Observations on the Use of Leeches.* 1. The capacity of leeches for drawing blood differs considerably; one leech is calculated to draw, on an average, about a drachm and a half to two drachms of blood, exclusive of that which flows subsequently, which often equals the quantity abstracted by the leech. Dr. A. H. Leith, of the Bombay Army, after repeated observations, found as a general rule that Indian leeches draw from four to five times their weight of blood, the fluctuation being apparently dependent on the state of the leech, and partly on the vascularity of the part to which they are applied. In order to obtain four or five ounces of blood, he therefore orders one ounce of leeches to be weighed and applied; if ten or twelve ounces, he orders two ounces and a half of leeches, and so on. Local depletion can thus be practised with a precision equal to that by cupping. These results are confirmed in

[1] Practitioner, Aug. 1884. [2] Lancet, 1879.

a great measure by M. Moquin-Tandon,[1] who states that small leeches will draw $2\frac{1}{2}$ times, small middle-sized leeches 4 times, large middle-sized ones $5\frac{1}{2}$ times, and large ones $5\frac{1}{11}$ of their own weight of blood.

2. In order to make leeches bite readily, thoroughly cleanse the surface of the skin with soap and water, and then dry it; this is particularly necessary if an embrocation has been previously employed. If they will not bite, one of the following plans may be tried:— 1, remove the leech from the water and roll it for fifteen or twenty minutes in a warm dry cloth; 2, lower the temperature of the surface of the skin; 3, smear the surface with cream or sugared milk; 4, roll the leech in porter; 5, make a puncture with a lancet, and smear the blood over the surface; this is often effectual. It should also be remembered that the fumes of sulphur, vinegar, or tobacco in a room will often effectually prevent leeches from biting at all.

3. To make leeches bite on particular spots, take a piece of blotting-paper and make in it as many small holes as there are leeches, the holes corresponding with the spots on which it is desired to apply the leeches; they are then to be covered over with a tumbler; the animals, finding themselves on a rough surface, creep about till they come to the openings in the paper, when they instantly bite the exposed points of the skin; the blotting-paper is easily removed by being moistened.

4. Leeches should never be applied to the tonsils, orifices of the uterus, or rectum, excepting by means of a glass properly constructed for the purpose, otherwise they may get beyond reach and do much mischief; should, however, such an accident occur, a strong solution of common salt, either by mouth, or enema, or injection, as the case may require, will be sufficient to dislodge them.

5. In order to apply leeches to the os uteri a moderately sized speculum should be first introduced, so that its upper extremity touches the vaginal portion of the cervix at every point, and a small piece of lint is next inserted in the os itself; the leech or leeches are then pushed into the tube, and allowed to fix themselves on the exposed portion of the cervix. An injection of tepid water should precede their application, and it may be necessary to remove the discharge covering the cervix by means of a piece of lint. When the leech attaches itself to the interior of the os or to the vaginal wall, the patient usually experiences sharp pain: to detach the leech under such circumstances, an injection of salt and water is to be used.

6. Great care is necessary in the application of leeches to infants and young children; the loss of a small quantity of blood produces a more sensible effect upon them than a proportionate quantity upon adults; and it should be borne in mind that, on account of the thinness of the skin and the greater vascularity of the subjacent parts, a leech will abstract a greater quantity of blood from a young child than from an adult. In the case of children, leeches

[1] Med. Zoology, p. 146.

should, if possible, be placed on some part of the body where the bone is near the surface, so that counter-pressure may be conveniently made in case of excessive hæmorrhage. Dr. Garrod advises that leeches should not be applied to an infant towards evening, unless quite unavoidable, lest hæmorrhage continue unchecked through the night. In these cases, especially, we should bear in mind the difference between a large leech and a small one, the former, from the size of its mouth, leaving a much larger and more gaping wound than the latter.

7. There is more danger than is usually imagined in applying leeches a second time; there can be little doubt that some diseases, particularly syphilis and puerperal fever, have been transmitted by the too hasty application of leeches which have been previously employed in these diseases; too little attention is usually paid to this point.

8. To remove leeches, if they do not drop off by themselves (which they generally do in fifteen or twenty minutes), sprinkle them with a little cold water, or a little vinegar and water or powdered sugar.

9. To promote bleeding from leech-bites, apply fomentations or warm dry cloths, which should be changed frequently; the application of cupping-glasses over the bites greatly promotes the flow of blood.

10. To check hæmorrhage from leech-bites, expose them to cold air, carefully removing coagula, or make continued and firm pressure with the finger; or, if these fail, apply styptics, as matico or alum, or a hare-lip pin passed beneath the bite will check the bleeding. (See Index—*Hæmorrhage from Leech-bites.*)

11. In order to preserve leeches, add a piece of charcoal to the water, and do not change it too frequently—once or twice a week at the furthest; when they are to be taken a long voyage, they should be carried in well-charred casks.

1185. *Therapeutic Uses. In Acute Pericarditis, Peritonitis, Pleuritis, and Hepatitis,* the application of leeches often affords sensible relief to the urgency of the symptoms.

1186. *In Acute Laryngitis,* leeches applied to the throat are valuable auxiliaries to general treatment, but they are of little service beyond reducing the local heat and swelling. *In Chronic Laryngitis,* a few leeches to the sides of the throat may be applied with advantage. *In Parotitis* (*Mumps*), when the pain is great and resists hot fomentations, one or two leeches often afford speedy relief. *In Tonsillitis,* leeches applied by means of a proper glass to the tonsils are productive of the best effects, according to the experience of Crampton and others.

1187. *In Nephritis and Nephralgia,* the local abstraction of blood from the surface over the kidneys is a valuable auxiliary to the hip-bath and other treatment.

1188. *In Acute Dysentery,* leeches (6 to 12) to the verge of the anus often afford sensible relief to the tormina and tenesmus, and exercise a favourable influence on the course of the disease by un-

loading the portal and hæmorrhoidal veins. Thus applied, they also prove most useful in *Congestion of the Liver:* in these cases, Dr. Graves obtained excellent results from two leeches every second day to the verge of the anus, repeating them sometimes as often as fifteen times.

1189. *In Gastritis,* depletion is only required in cases of great severity, and even here is best limited to the application of leeches to the epigastrium; the relief afforded by them is sometimes very marked. A few leeches to the same site will often relieve the pain attendant on *Ulcer of the Stomach,* but the practice, especially in the weak and cachectic, is of doubtful propriety. *In the passage of Gall Stones,* if there be much tenderness on pressure, great relief will often be obtained by a few leeches over the region of the gall-bladder. (Dr. Murchison, p. 350.)

1190. *In Vomiting connected with Uterine Affections,* Dr. Tilt (p. 327) states that after all ordinary remedies had failed, he has on several occasions seen it suddenly checked by the application of six leeches to the pit of the stomach, although there was no sign of inflammation there, and although the patient's debility was such as not to justify loss of blood. The same measure has occasionally been found useful in *Idiopathic Vomiting.*

1191. *In Congestion of the Brain, in threatened Apoplexy or Paralysis arising from the suppression of an habitual discharge, as from Piles,* a few leeches to the verge of the anus often afford more immediate and permanent relief than three times the number applied to the temples or other part of the body. They are equally applicable if the threatened attack arise from suppression of the menses, but in such cases the leeches should be applied to the inner side of the thighs. *In Congestive Headaches,* leeches may be applied with advantage to the temples, or to the crown of the head, or in the situation advised above.

1192. *In Acute Hydrocephalus,* when much febrile action is present, the local abstraction of blood by leeches sometimes proves serviceable. Dr. West judiciously directs that they should be placed on the crown of the head rather than on the temples; they are inadmissible when the little patient is much debilitated.

1193. *In Uterine Affections,* leeches are chiefly of service when there are inflammatory symptoms present, where the pain is more or less constant, and the patient is of full habit. In plethoric individuals, who suffer a good deal at the menstrual periods (*Dysmenorrhœa*), leeches applied to the inside of the thighs once a month, halfway between the two periods, are often of decided benefit. *In Acute Inflammation of the Uterus or its Appendages,* leeches to the hypogastric region may be required. *In cases of Pain dependent on long-standing Congestion or Chronic Inflammation of the Uterus,* leeches applied to the cervix uteri are very serviceable. *In cases where the Ovaries are the seat of persistent pain, or tenderness and aching,* leeches may be applied over the groin, or inside the thigh, with good effect. *In cases of Peri-uterine Hœmatocele,* the early application of leeches is to be recommended, but at

a later period, except to check inflammatory action, they are inadmissible.

1194. *In Amenorrhœa*, the application of leeches to the os uteri a few days previous to the catamenial period has been favourably spoken of by Dr. Ashwell, Dr. Davis, and others.

1195. *In Pruritus Scroti, Pruritus Ani, and Pruritus Pudendi*, leeches applied round the affected part, and followed by anodyne fomentations, are often productive of much relief. Remedies which had failed to make any impression previous to the use of the leeches, are often very effectual after their application. *Sycosis, Psoriasis, and other obstinate Skin Diseases*, are sometimes benefited by the application of leeches to the sound skin in the neighbourhood of the disease. *In Inflammation of the Skin and subjacent Tissues during the formation of Abscesses*, when the part is hot, swollen, and tense, leeches applied to the affected part are often effectual in mitigating the inflammation and in affording relief.

1196. *In Phlegmasia Dolens*, leeching the seat of pain and swelling is commonly of great service, especially during the acute inflammatory stage: the limb, wrapped up in cotton-wool surrounded with oil-silk, should be kept slightly raised on an inclined plane and flexed inwards, so as to take off tension from the affected vessels. (Dr. R. Barnes.[1])

1197. Hydrargyrum. Mercury or Quicksilver.

A metal which, in its pure (liquid) state, is apparently inert, large quantities of it having been taken without producing any physiological effects; but occasionally, when subjected to the action of the secretions of the stomach and intestines, it undergoes chemical changes, and acquires powerful medicinal properties. Workmen and others much exposed to the vapour of mercury, are subject to tremors and other affections of the nervous system, which not unfrequently prove fatal. When rubbed into the skin or administered internally, in a state of minute subdivision, it acts energetically on the system. It is of great importance in medicine, as the base of several valuable preparations.

Physiological Effects. When taken in moderate doses, mercurial preparations increase the action of the various secreting glands and organs; stimulating some, the salivary glands for example, in an especial manner. From their power of augmenting the secretions, they are variously denominated sialagogue, cholagogue, purgative, diuretic, &c. Some of these effects are probably due to their general action on the system, removing morbid states which interfered with the due performance of the secreting functions of the organs, rather than to a direct effect on them. Mercury becomes readily absorbed into the system and has been detected in the blood, the urine, the saliva, the milk, and indeed, as Wood expresses it, "in every conceivable secretion and in every tissue" (p. 397). Mercury causes in the constitution, in some more than others, a great amount of irritability, making it more susceptible of all impressions. It quickens the pulse, increases its hardness, and occasions a kind of temporary fever, which, however, commonly diminishes when the patient has become habituated to the medicine. This irritation is chiefly observable when it is administered in small doses; in large ones it has been found to calm the system, and to act apparently as a direct sedative. If long continued, it produces a specific action on the salivary glands, commonly called salivation or ptyalism. For a long period it was a generally received opinion

[1] Lancet, Sept. 30, 1865.

that mercury acted specifically on the liver, increasing in a marked degree the biliary secretion, and hence it ranked foremost in the list of cholagogues; but the researches of a committee appointed to examine into the subject, as expressed by Prof. Bennett,[1] are opposed to such a conclusion: indeed, the experiments made on dogs would tend to show that under the use of mercury the biliary secretion is considerably diminished. Its supposed *modus operandi* in affections of the liver is given below. According to the researches of Dr. Keyes,[2] mercury in small doses acts as a tonic, increasing the weight of the body, and likewise the proportion of red corpuscles in the blood, but these latter become diminished when the mercurial is carried to excess. During severe ptyalism emaciation takes place rapidly; the blood then suffers very decidedly, becoming more fluid and watery than normal, and losing in a degree its power of coagulation. Dr. Wright found its solid constituents to be notably diminished, including albumen, fibrin and the red corpuscles, and that it contains a large quantity of a fetid, fatty material. These observations of Wright have been confirmed upon animals by Dr. Wilbouchewitch and by Dr. J. Hughes Bennett. (Wood p. 395.) Sir B. Brodie observes, that in many instances a course of mercury renders the urine alkaline; in some individuals, a single dose of calomel will produce the same effect. In numerous analyses of the urine of patients under the influence of mercury, Dr. Owen Rees failed to detect a trace of albumen. The urine is generally increased in quantity. In the saliva of persons under the same circumstances, Simon found an increase of solid constituents; and, according to Dr. Bostock,[3] it is less viscid than in a healthy state, and contains a substance analogous to coagulated albumen. Mercurials produce the absorption of morbid fluids and materials of low organization—*e.g.*, the albuminous matters which are deposited in the tissues in syphilis. It is uncertain whether they produce this effect by directly stimulating the absorbents or by preventing fresh deposition. In large doses, some of the salts of mercury, particularly the bichloride, act as irritant poisons.

The occasional ill Effects of Mercury. 1. *Griping and Purging.* This may be partially obviated by combining it with a sedative; or it may be necessary, if the stools become bloody and dysenteric, to discontinue it altogether. 2. *Sore Throat, Ulceration, or Sloughing of the Tonsils*, accompanied with fever. In this case the medicine should be discontinued, and the ulcerated throat treated on general principles. 3. *Violent Salivation*, which not unfrequently terminates in sloughing. 4. *A renewal of Salivation at a future period.* There are many cases of this on record. In one, related by Christison, salivation reappeared at the end of four months, although no mercurial had been given in the interval. 5. *Eruptions of the Skin.* 6. *Erethismus Mercurialis*, which is characterized by a great depression of the vital powers, a sense of anxiety about the præcordia, irregular action of the heart, frequent sighing and faintness, which occasionally proves fatal. The medicine should be immediately discontinued, and the patient exposed to a healthy atmosphere, and tonics and liberal diet employed. 7. *Rheumatic Pains and Nodes*, resembling those produced by syphilis. 8. *Mercurial Palsy*, and other derangements of the nervous system. 9. A cachectic state of the constitution, known as *Cachexia Mercurialis.*

No certain rules can be laid down respecting the appearance of these ill effects: in some instances, they appear after a few moderate or small doses; in others, it may be continued for months without any apparently ill effects. The appearance of any of them indicates the necessity of immediately relinquishing the use of the remedy. (See also next Section.)

Remarks on the Use of Mercurial Preparations. 1. From a peculiar idiosyncrasy, some persons are unable to take the smallest dose of mercury without its producing serious, and occasionally fatal, consequences: for example, Christison quotes a case in which exfoliation of the jaw, and death, resulted from the external application of three drachms of mercurial ointment; and in another, the same effects were produced by two grains of calomel. Before

[1] Brit. Med. Journ. May 8, 1869.
[2] Amer. Journ. Med. Sci. Jan. 1876.
[3] Med.-Chir. Trans. vol. xiii.

commencing its use, therefore, inquiry should be made whether, on any former occasion, it has disagreed. If so, mercury in any form should be avoided.

2. The action of all mercurial preparations is promoted by a previous use of depletory measures.

3. The age, sex, temperament, and general health of the patient influence greatly the action of mercury. Children are salivated with great difficulty. Drs. Bennett, Clarke, Evanson, and Maunsell, state that they have never seen a child under two years of age, in whom unequivocal salivation was established. Aged persons are also extremely difficult to bring under the influence of mercury. Prof. Graves accounts for this circumstance in both cases (children and old persons) by the undeveloped state of the parotid glands in the former, and by their shrunken and atrophied state in the latter.

4. Persons in robust health are generally very slightly susceptible to the action of mercury; and the state of health in the same person at the time of taking the medicine greatly modifies its effects; thus, a woman who will resist its influence for a considerable period when in health, will be salivated by a single dose when suffering from anæmia.

5. Those who pursue their outdoor avocations, and at the same time live freely, are with great difficulty brought under its influence; and Dr. Macgregor states that it is almost impossible to salivate a person who smokes largely.

6. In some acute inflammations, particularly in that of the brain, and in suppurative inflammation of the liver, it is with great difficulty that ptyalism can be established.

7. The sanguine temperament is less susceptible to the action of mercury than the nervous and lymphatic.

8. An animal diet retards, and an antiphlogistic regimen assists, the development of mercurial action. Acids also interfere with it.

9. In order to insure the certain and rapid effects of mercury, the patient should carefully avoid exposure to great atmospherical changes. Exposure to wet should be particularly avoided.

Mercury is either contra-indicated or injurious. 1, *in tubercular disease*, and in all diseases including syphilis, occurring in persons of a strongly marked scrofulous diathesis; 2, *in Phagedænic Ulceration*; 3, *in Gout*; 4, *in Scurvy, and in persons of the Scorbutic diathesis*, the employment of mercury is unsafe and injurious; 5, *in Inflammatory Dropsy*, Dr. Todd cautions the practitioner against the use of mercury, regarding it not only as useless, but injurious; 6, *in Inflammation of the Bladder*, Sir B. Brodie says that mercury is certainly not beneficial, and is often injurious; 7, *in Diabetes*, Dr. Prout says that he has almost invariably seen it produce mischief; 8, *in Granular Disease of the Kidney*, it is condemned by Christison and most subsequent writers. It should not be given in *Dropsy dependent on Granular Disease of the Kidneys*. As a rule it should not be administered when the urine is albuminous; 9, *in Ulceration of the Stomach*, its use is strongly condemned by Dr. Brinton: he states that he has known even a single calomel purgative apparently undo all that months of sedulous treatment had been able to effect towards the relief of a gastric ulcer; 10, *in Enlargement of the Spleen*; and 11, *in all Anæmic states from whatever cause arising.*

Modes of Administration. 1. *Internally.* This is the best mode as a general rule. The salt to be employed, and the particular dose, must be regulated by the severity or character of the disease to be treated: thus, in chronic or mild cases, the less active preparations of mercury, as hyd. c. cret., or small doses of blue pill, are indicated. Its alterative effect is also well obtained from minute doses of corrosive sublimate. In acute diseases, when its antiphlogistic powers are required, no salt is equal to calomel, in doses of gr. j.–ij. every three or four hours, combining it with opium to prevent its passing off by the bowels. Some practitioners, with a view of speedily affecting the system, have advised calomel in gr. xx. doses, repeated at long intervals; whilst others employ very minute doses, frequently repeated. Dr. Law,[1] of Dublin, found that

[1] Dublin Journ. Jan. 1839.

gr. $\frac{1}{12}$ of calomel, repeated every hour, will produce salivation in from twenty-four to thirty-six hours, and the same effect may be produced by blue pill in equally minute doses; the whole quantity required never exceeding six grains. Mr. Clay, of Manchester, also advised this mode of administration; and in several instances I have in this manner induced soreness of the mouth in Hindoos, not more than two grains of calomel thus exhibited being requisite to establish soreness of the mouth and mercurial fetor of breath. 2. *Inunction.* This is the most ancient mode of administering mercury; and when it is desired speedily to affect the constitution, it may be advantageously combined with the internal use of the same remedy. Sir B. Brodie (alluding to its use in syphilis) considers that it is the most certain and preferable mode; that it is less apt to gripe and purge; and that it does not damage the constitution half as much as when taken by the mouth. To be effectual, ʒss.–ʒj. of mercurial ointment should be rubbed in before the fire, for three-quarters of an hour at first, and afterwards for a shorter time. The inunction method is characterized by Mr. J. Hutchinson,[1] as safe and very efficient, but dirty and inconvenient. Amongst the highest continental authorities this plan, he says, holds undisputed pre-eminence in the treatment of constitutional syphilis. 3. *Fumigation.* This mode has been strongly advocated by Mr. Langston Parker and Mr. H. Lee; and it is favourably spoken of by Mr. J. Duncan, of Edinburgh,[2] who considers that it acts by three distinct processes: 1, the introduction of mercury into the system; 2, the production of diaphoresis, and 3, the topical effect of the remedy. He agrees with Mr. Lee in regarding calomel (gr. xx.) as the mercurial best suited for the purpose. The best apparatus, he says, is a simple porcelain dish, divided into two compartments, one containing the mercury, the other an ounce or two of water, placed on a tripod with a spirit-lamp below it. Along with the patient, it is enveloped in blankets or tarpaulin, being covered with a large cage, if the patient be in bed, or by the chair if he be seated. In this the patient should remain for 20 minutes. The water is not essential to the process, but renders it more comfortable, and aids diaphoresis. "If the patient be directed to take each time a few inhalations of the fumes, if ablution is forbidden, and the under-clothing impregnated with the fumes, be retained in contact with the skin, then with only twenty grains of calomel, salivation may be produced in many cases with considerable rapidity. Mr. Hutchinson (*op. cit.*) characterizes it "as an admirable plan," its only drawbacks being the expense and the trouble which attend it. 4. *Subcutaneous Injection.* The recorded experience of many high Continental authorities, notably Lewin of Berlin, during the last twenty years, leaves no room for doubt as to the safety of the subcutaneous introduction of mercury into the system, and of its applicability, under certain conditions, for the treatment of syphilis. It has not, however, come into general use in this country, and the words of Hill and Cooper, written in 1881, express the general feeling on this point. "Owing to the effects of introducing mercury by the system by this means," they remark, "being identical with those attending its introduction by other channels (mouth, skin), and being no more than those methods a security against relapses, subcutaneous injection should in our opinion be reserved for patients who fail to absorb mercury when given by the usual methods, or whose critical condition renders their immediate subjection to mercury desirable—*e.g.*, in cases of severe affection of the eye, or brain, or other internal organ" (p. 423). Certain precautions in its use are necessary. 1. The syringe must be specially reserved for such cases, and have a fine steel canula, of which the point is frequently sharpened; it must be also carefully cleaned after every injection. 2. The quantity of fluid to be injected should be from 10 to 12 minims; a large bulk causes pain at once while a concentrated solution is productive of greater hardening and aching afterwards. 3. The amount of the mercurial salt (perchloride) varies from gr. $\frac{1}{20}$ to $\frac{1}{5}$, and two injections of gr. $\frac{1}{60}$ each in 24 hours, are less painful than a single one of gr. $\frac{1}{10}$. The solution should be freshly prepared and carefully filtered each time before use. 4. The part of

[1] Lancet, Jan. 21, 1874. [2] Edin. Med. Journ. Aug. 1878.

the body where least pain is felt is the flank, the arms and legs, from their necessarily frequent movement, are objectionable, but the ease with which they are uncovered renders them favourite sites. 5. The point of the syringe must always be carried carefully *through* the skin into the subcutaneous fat, otherwise a slough or abscess will almost certainly follow the injection (Hill and Cooper).

1198. *Therapeutic Uses. Syphilis.* For nearly three centuries, mercury was regarded as a specific, and employed indiscriminately in every case which came under treatment. This injudicious practice was fully exposed by some of our military surgeons, including Hennen, Rose, Guthrie, &c., some years since; and much has been written both for and against the mercurial treatment of syphilis. In France, for instance, M. Ricord has advocated the practice of giving a six months' course of a daily dose of mercury, followed by a three months' course of iodide of potassium, in cases of indurated chancre. On the other hand, so high an authority as Professor Syme stated that the natural history of syphilis, where treated by hygiene and external applications without mercury, is that of a very slight disease; and the non-mercurial treatment has been strongly advocated by Dr. Hughes Bennett, Dr. Drysdale,[1] Dr. Boileau,[2] and others. Mercury, however, still holds its sway in the practice of the most experienced surgeons of the day, who in the main agree with Berkeley Hill and Cooper (p. 413) in believing that steady, prolonged mercurial treatment, though not an infallible agent, is the only trustworthy one for preventing a return of the disease. Jonathan Hutchinson (*op. cit.*), whose large experience imparts great weight to his opinion, arrives at the conclusion that mercury is probably a true vital antidote against the syphilitic virus, and Mr. Brudenell Carter,[3] another high authority, gives the palm to mercury over its chief rival the iodide of potassium, in the following terms:—"Nothing in clinical history is more remarkable," he observes, "than the rapid amelioration of the symptoms of the late forms of syphilis under the use of the iodide: nothing is more certain, generally speaking, than their recurrence in the same, or in some modified form. Mercury, on the other hand, will be slower in producing its first action, but more effectual as against the syphilitic taint."

Cases in which Mercury is appropriate. When a patient in fair health has a hard-based, indolent ulcer, or excoriation, with enlarged inguinal glands; whenever the eruption has a desquamating form; "in progressive ulceration of the skin in late syphilis, if iodide of potassium fail, mercury often arrests the disease at once. If a syphilitic woman become pregnant, she should take mercury during her pregnancy, that the child may be shielded from contagion. When the patient, during a long course of syphilis, is enfeebled, and reaps little benefit from ordinary tonic treatment, he will often regain strength when brought under the influence of mercury. In short, whenever the disease makes no progress with-

[1] Med. Times, March 26, 1864.
[2] Brit. Med. Journ. July 19, 1879.
[3] St. George's Hosp. Rep. vii. p. 112.

out it, however late the stage, or whatever the form, mercury should be used. The maxim, 'iodide eases, mercury cures,' is rarely inapplicable in obstinate cases of syphilis. Indeed, however completely the symptoms may have been dispelled by the iodide, the cure should be rendered lasting by a finishing course of mercury." (Hill and Cooper, p. 410.)

The length of time Mercury should be continued is very difficult to define. In numerous cases the disease has a very short course if mercury be commenced as soon as the indurated base of the ulcer shows the presence of syphilis unmistakably. The best results are obtained by continuing the drug until all the symptoms have subsided, and by continuing small doses for two or three weeks longer, after which a pause of four or six weeks should be allowed before it is repeated for a second course of three months. At the end of the second course, another month's interval may intervene before a third course is begun. In this way, mercury should be given more or less continuously for a year after infection. By this time, should no symptoms appear, medicines may be withdrawn altogether, but the patient should be kept under observation, to watch for any further outbreak of the disease. (Hill and Cooper, p. 411.)

Whatever variety of the drug be selected, the dose should be small, and in a form not likely to excite disturbance of the bowels. Blue Pill (gr. j.; Ext. Gentian., gr. j.,) or Hyd. c. Cret. (gr. j. Pulv. Ipecac. Co., gr. ij.) are the best preparations to commence with, and should be given with food three or four times daily. This mode of administration will be found more effective than a larger dose at bedtime, and less likely to cause irritation of the bowels. If the gums are not beginning to swell after a few days, the dose may be increased, or some more active preparation substituted. When the drug begins to be felt, the patient should omit his dose for a day, and then continue with about two-thirds of the original dose: this will keep up the requisite influence, and avoid any injurious influence. Full salivation is not in all cases necessary for therapeutic purposes. In most persons, all the useful effects of mercury are attained when the slightest possible sign of its influence is betrayed by the gums, but exceptions are met with. On this point, Mr. Brudenell Carter (*op. cit.*) observes, "Save in cases of idiosyncrasy, in which mercurial poisoning may be produced by a single moderate dose, there should be no such thing as a sore mouth resulting from treatment. The slightest line upon the gums indicates a point beyond which the medicine should not be pushed: and the highest art of administering mercury is to keep the patient, as it were, on the brink of this line without permitting transgression of it. For this purpose the inexperienced practitioner must be content to feel his way, and the most experienced will constantly find that he can do no more."

The other Therapeutic Uses of Mercury will be more fully enumerated in the succeeding articles, particularly in the article Hydrargyri Subchloridum.

1199. Hydrargyrum Ammoniatum. Ammoniated Mercury. White Precipitate of Mercury.

Med. Prop. and Action. It is said to be a powerful salt, death having resulted from its use; but it is never given internally. Iodine, chlorine, and bromine act violently on white precipitate, the action being often attended with explosion. Hence their combination in prescriptions should be avoided. Externally, it is employed in the form of ointment (gr. lxij. ad Ung. ʒj.).

1200. *Therapeutic Uses. Skin Diseases. In Acne Indurata, Impetigo, Porrigo, Psoriasis, Herpes, and in the dry stages of Eczema,* the white precipitate ointment is an efficacious application. *Ringworm,* when recent, occurring on the body or limbs, will sometimes yield to this ointment. It will rarely succeed on the hairy scalp. It is best used conjoined with sulphur, thus:—℞ Sulphur. gr. xx., Hyd. Ammon. gr. xxx., Ung. Simpl. ʒj. M. To be applied twice daily for five or six days. This, in recent cases, will often effect a cure. *In Sycosis,* its use is often attended with excellent effect; the parts should be bathed with black wash before each application. *In Herpes Zoster,* it is said to subdue the pain and irritation in a remarkable manner. *In Lichen and Pityriasis Palmaris,* it is advised by Sir E. Wilson. Ammoniated mercury dusted on the surface, or employed in the form of ointment, destroys *pediculi. In Impetigo Contagiosa,* white precipitate ointment is highly useful. It should in most cases be diluted with simple ointment, or vaseline.

1201. *In Chronic Articular Inflammations,* Dr. Phillips (p. 653) prefers to all other mercurial applications gentle frictions with diluted white precipitate ointment (one part of the off. ointment to four of simple cerate at first, and afterwards one to eight) twice or thrice daily. Under this, he states, he obtained good results, which other remedies had failed to procure.

1202. *In Ophthalmia Tarsi,* white precipitate ointment, applied to the margins of the eyelids at night, is sometimes of the greatest benefit.

1203. Hydrargyri Iodidum Rubrum. Red Iodide of Mercury.

Med. Prop and Action. Alterative-tonic and stimulant, in doses of gr. $\frac{1}{10}$, gradually increased to $\frac{1}{4}$, in the form of pill or dissolved in alcohol. In its irritant properties it resembles corrosive sublimate. Its effects on the system are similar to those of the green iodide, but it is much more irritant in its action. In long-continued doses it produces salivation. It requires to be given with great caution, and to be discontinued if it cause much irritation. Left in contact with the skin, it causes inflammation; and when applied in the form of ointment (gr. xvj. ad Ung. ʒj.) to ulcerated surfaces, it occasions considerable pain.

Dose, gr. $\frac{1}{32}$–$\frac{1}{8}$, in the form of pill or in solution.

1204. *Therapeutic Uses. In Secondary and Constitutional Syphilis,* it has been recommended by Dr. O. Royle and others; but it is far more irritating than, and possesses no advantages over, the green iodide (*q.v.*).

1205. *In Bronchocele,* the red iodide is one of the best applications we possess. The great success which attended its use in India by

Capt. Cunningham, of the 12th Cavalry, first attracted attention to it; and the evidence adduced by Dr. F. Mouat[1] and Mr. Macnamara[2] has established its claims beyond a doubt. The strength originally proposed (℥ix., Ung. lb. iij.) has, however, been found far too powerful for ordinary use. Fifteen grains to the ounce is sufficiently strong for even the worst cases. This is directed to be smeared or rubbed in for a few minutes over the whole surface of the goître, which should then be exposed to the sun's rays as long as they can be endured. Within half an hour smarting and burning are felt, and in another hour a blister forms, which needs to be treated in the usual way. The good effects of the iodide continues long after the blister has healed, the tumour decreasing day by day for several weeks. One application every two months is sufficient for the most extreme cases. Mr. Macnamara has often seen tumours which extended from the chin to the breast disappear after two or three applications. He never saw salivation produced, though it is said to have occurred in some exceptional cases. (Phillips.) Dr. Frodsham[3] tried to substitute artificial heat for the sun's rays, but found it ineffectual. *In Elephantiasis Arabum*, it is favourably spoken of by Dr. F. Day.[4] He found the ointment (*ante*) far too strong, and substituted a weaker one (gr. j. ad Ung. ℥v.): even this he found to cause at first slight irritative fever and augmentation of the size of the limb, but as these subsided improvement soon became manifest. The strength of the ointment may be gradually increased. My own trials with Dr. Day's ointment in the elephantiasis of Travancore gave very satisfactory results.

1206. *In Chronic Glandular Enlargements and other Tumours probably of strumous origin*, the ointment of the red iodide has been found of striking benefit by Dr. M. T. Sadler,[5] and others. Dr. Sadler has also found it useful in promoting the removal of *Gouty Deposits* in the neighbourhood of joints.

1207. *In Malarial Enlargements of the Liver and Spleen*, Dr. Maclean, of Netley (i. p. 68) obtained the best results from the application of the red iodide ointment (*ante*), and strongly recommended its use. Its value in *Splenic Enlargements* has since been tested by Mr. Macnamara (op. cit.), Dr. Andrew,[6] and others, who report highly of it. The accepted treatment of these cases at Netley consists of the use of this ointment externally, and the phosphates of iron, quinine, and strychnia internally. (Murchison.) Generally speaking, neither salivation or other ill-effects of mercury followed, but Sir J. Fayrer[7] observed serious results from its use in *Splenic Cachexia* with tenderness of the organ and much debility. Still, in all chronic cases it ought to receive a fair trial. (Phillips.)

[1] Indian Ann. of Med. Sci. 1857, vol. iv. p. 436.
[2] Phillips' Mat. Med. Inorgan. p. 652.
[3] Lancet, June 2, 1860.
[4] Madras Quart. Med. Journ. July, 1860. p. 51.
[5] Lancet, Dec. 12, 1863.
[6] Lancet, vol. i. 1869.
[7] Med. Times, vol. i. 1874.

1208. Hydrargyri Iodidum Viride. Green Iodide of Mercury.

Med. Prop. and Action. Alterative, tonic and stimulant. In long-continued doses it occasionally produces salivation, and in large quantities proves an irritant poison. Externally, it is applied in the form of ointment.

The green iodide has been omitted from the B.P. of 1885.

Dose, gr. $\frac{1}{4}$–gr. j. in pill; or in "granules."

1209. *Therapeutic Uses.* *In Syphilis*, the green iodide is a favourite preparation with some surgeons, on account of its great activity and solubility, though from the readiness with which it decomposes it sometimes fails to produce any effect; while, on the other hand, it is more apt than blue pill, calomel, or the perchloride to cause griping and purging; hence, except in very small doses, it cannot be prescribed without opium, lettuce, &c.—*e.g.* ℞ Hyd. Iod. Virid. gr. j., Ext. Gentian. gr. j., Ext. Lactucæ gr. ss. M. ft. pil.; vel ℞ Hyd. Iod. Virid. gr. $\frac{1}{3}$–j., Ext. Opii gr. $\frac{1}{4}$–$\frac{1}{2}$, Ext. Hæmatox. q.s. Ft. pil. To be taken two or three times a day. The latter may be substituted when the former purges. (Hill and Cooper, p. 415.) It is specially adapted for *Syphilitic Eruptions and Ulcerations*, in which it may be advantageously employed both externally and internally.

1210. *Skin Diseases.* *In Pityriasis, Eczema, Herpes, Impetigo and other Diseases of the Scalp*, occurring in children, Dr. Neligan derived great benefit from the following formula:—℞ Hyd. Iod. Vir. gr. ss. Hyd. c. Cret. gr. ij., Pulv. Aromat. gr. ij. M. To a child of six years old this may be given every morning; or if not more than three years old, half the quantity may be given twice a week. It should not be given to infants. It has also been successfully employed in other skin diseases—*e.g.*, *Lupus*, *Rupia*, *Lepra*, *Psoriasis*, *Mentagra*, *and Acne Rosacea.* In these cases its internal administration greatly aids its external use. *In Bronchocele*, Porta strongly advises an ointment composed of gr. v. of the green iodide in gr. xx. of lard. It is inferior to the red iodide.

1211. Hydrargyri Nitratis Liquor Acidus. Acid Solution of Nitrate of Mercury.

Med. Prop. and Action. Powerful caustic and escharotic; never employed internally. It should be painted over a space about 1 or 1½ inch in diameter, by means of a brush; and lint, moistened with the solution, is then applied. An ulcerated surface thus dressed becomes immediately white; a kind of erysipelatous inflammation is set up in the surrounding parts; and in a few days a yellow scab gradually falls off. (Pereira.) The local application has been known to produce salivation, and its use is not unattended with danger: a case is on record[1] in which serious toxic effects followed its application to a space not bigger than a half-crown.

1212. *Therapeutic Uses.* *In Obstinate Skin Diseases*, it has been used with much advantage. *In Lupus*, according to Mr. Milton, it is a very valuable application. When its use is restricted to small surfaces, to tubercles, and to patches in which the morbid

[1] Lancet, Jan. 3, 1874.

action has been a good deal subdued, or which are healing too slowly, it is often of great service. The pain it causes, if properly used, is not great. It should first be brushed very lightly over the part, and the surface immediately after bathed with water. It requires to be repeated daily. Care should be taken to protect the surface from exposure to the air.

1213. *To Cancerous, Syphilitic, and Scrofulous Ulcerations* requiring the application of escharotics, the acid nitrate has established claims to notice, but great care is requisite in its use, and the space to which it is applied should be very limited. *To Syphilitic Warts and Vegetations* it has also been used as a caustic, but Hill and Cooper (p. 590) consider that it possesses no advantages over nitric acid (*q.v.*).

1214. *In Ulceration of the Cervix Uteri*, it has been employed as a caustic. Dr. J. Bennet considers nitrate of silver preferable in mild cases, but in severe ones he speaks highly of the nitrate of mercury, as also does Dr. West (p. 122), who considers that with moderate care its employment is unattended by risk. He gives full directions for its application.

1215. HYDRARGYRI NITRATIS UNGUENTUM. Ointment of the Nitrate of Mercury. Citrine Ointment. A substitute for the Golden Eye Ointment.

Med. Prop. and Action. A valuable stimulant application. By long keeping it decomposes, changes its colour, and becomes irritating; so that it should be used when freshly made, or not at all (Vernon). It may be diluted to any degree.

1216. *Therapeutic Uses. Diseases of the Skin. In Lepra, Psoriasis, and other Squamous Skin Diseases,* few local applications are more useful than this ointment. It has also been extensively employed in other affections of the skin, particularly in *Sycosis, Impetigo, Pemphigus*, and all forms of *Porrigo*, when unattended by inflammation. *In Eczema*, when it has reached the dry stage, Mr. Milton regards the dilute ointment as the most effectual remedy we possess. *In Ringworm*, the strong ointment, rubbed for some minutes over the affected surface, twice daily, is often effectual in removing the disease. *In Chloasma*, and also in *Favus*, it has been used with advantage. In these and other skin diseases, the use of the ointment should be preceded by emollient poultices, the strength of the ointment being regulated by the feelings of the patient, as it should never be employed so strong as to cause pain; alteratives should be administered, the bowels carefully regulated, and strict cleanliness enforced.

1217. *In Pruritus Scroti*, it is highly spoken of by Dr. Bowling (U.S.). He advised the parts to be sponged with vinegar previous to its application. By these simple means he states that for fifteen years he has not failed in a single case to effect a permanent cure. Dr. B. Squire[1] corroborates Dr. Bowling's statements regard-

[1] Med. Times, June 6, 1868.

ing the dilute ointment as one of the very best remedies in cases of *Prurigo*. According to the same authority (Syst. v. p. 974), it is very effectual in *Phthiriasis*. It does not require to be rubbed into the skin; only to be smeared on the affected part.

1218. *To irritable Ulcers* the following ointment has been occasionally found useful:—℞ Ung. Hydrarg. Nit., Ung. Cetacei āā ʒss., Pulv. Opii ʒj. M. ft. unguent. *To Chapped Hands and Lips* the dilute ointment is a valuable application.

1219. *In Ophthalmia Tarsi, Granular Conjunctivitis*, &c., one of the most efficient applications is Ung. Hyd. Nit., of which a small piece may be mixed with an equal weight of almond oil, and applied to the edges of the lids at bedtime. The bowels and general health should be carefully attended to. Mr. J. Hutchinson[1] highly lauds its powers in this class of cases. He considers that there are probably thousands of children in our schools, &c., who are suffering from ulcerations on the cornea, with intolerance of light, causing great distress through many months, and destined often to leave disfiguring scars, three-fourths of whom would be almost well in a fortnight under the use of a very weak yellow oxide of mercury ointment. Care should be taken to use only the freshly prepared ointment.

1220. HYDRARGYRI OLEATUM. Oleate of Mercury. Pure oxide of Mercury, freshly prepared by precipitation, added to Oleic Acid, combines with it, and forms an Oleate of Mercury dissolved in Oleic Acid. A solution containing 5 per cent. is a clear pale yellow liquid, resembling olive oil, but thinner; the 10 per cent. solution, clear, fluid, as dark as linseed oil; whilst the 20 per cent. is opaque, yellowish, and of the consistence and appearance of resin ointment, melting readily at the temperature of the body, forming a kind of transparent varnish when applied to the skin.

Med. Prop. and Action. This preparation was introduced into practice by Prof. J. Marshall,[2] in 1872, as a substitute for the officinal mercurial ointments, over which it possesses the advantage of being more cleanly and economical in use, and, in consequence of the diffusibility or penetrating power of the oleic acid, of becoming more rapidly absorbed by the skin. It was incorporated into the B.P. in 1885. Its efficacy is greatly increased by the addition of morphine, gr. j. of the pure alkaloid to fʒj. of the solution; this, compared with preparations of mercury and opium, is pronounced "more elegant, economical, and efficacious." In its use all friction is avoided, as the solution has merely to be applied with a brush or spread lightly over the skin, otherwise it is apt to cause undue irritation. From 20 to 30 drops generally suffice for one application, twice daily at first, and at longer intervals subsequently. The 10 per cent. solution is that generally employed, and is the one dispensed by chemists, unless one of the other solutions is specified. For children and persons with delicate skins the 5 per cent. solution is preferable. Its permeating power is increased by the addition of one-eighth of ether. It leaves no stain on the skin or on the clothes. The morphine should be added to the oleate when required for use, as the combination in bulk is stated by Mr. Martindale (p. 189) not to keep well. The

[1] Brit. Med. Journ. Oct. 20, 1883. [2] Lancet, May 25, 1872.

oleate is peculiarly adapted for tropical practice, as it does not become rancid like animal fats.

1221. *Therapeutic Uses.* Space will only admit of a mere enumeration of the affections in which Professor Marshall has successfully employed the combined oleates of mercury and morphine: the principal of these are:—"*Persistent*" (*Chronic*) *Inflammation of the Joints, Synovitis with effusion, Arthritic, Rheumatic, and mixed forms of Joint Diseases, Inflammation of the Mammary Gland* either connected with lactation or otherwise, *Threatened Abscesses of the Perinæum* and *Indurations* left by the same, obstinate and painful *Tonsillitis, Epididymitis, Periostitis,* and *Inflammation with imminent or actual Suppuration of Lymphatic Glands.*

1222. *Skin Diseases,* especially *Syphilides, Sycosis Menti, Chloasma,* the various forms of *Tinea, Porrigo, Pruritus Ani et Pudendi,* and lastly, all those *Syphilitic Affections* for the cure of which mercury is applicable, are well treated by Oleate of Mercury.

1223. *In Congenital Syphilis,* a piece of the 20 per cent. ointment about the size of a pea or bean, placed in a child's axilla night and morning for five or six days, rapidly produces constitutional effects, and in the adult this mode of introducing mercury into the system in *Syphilis* is regarded as preferable to and less troublesome than the vapour-bath, and devoid of the unpleasantness of inunction. Hill and Cooper, however, do not report very favourably of it in this disease. Being more irritating than grey ointment, they remark (p. 419), it more quickly causes inflammation of the skin, a property that is useful when local influence is mainly desired, but detrimental when long-continued absorption is required. *In Syphilitic Skin Diseases,* however, they derived much benefit from the 10 per cent. solution, with or without morphine.

1224. In addition to the above the oleate has been successfully employed in *Psoriasis, Eczema, Acne,* &c.; but in none is its value better established than in *Ringworm and other Skin Diseases of a vegetable parasitic origin.* Dr. Shoemaker,[1] who has done much to bring the oleates into notice, suggests that they may often be employed advantageously in combination. He states that a mixture of the oleate of mercury (℥j.–ij.), and oil of ergot ʒj.) forms one of the best of oily applications for *Loss of Hair,* especially when the scalp is hard and dry.

1225. Hydrargyri Oxidum Rubrum. Red Oxide of Mercury. Nitric Oxide of Mercury. Called also Red Precipitate; one of the most poisonous preparations of Mercury.

Med. Prop. and Action. Stimulant and escharotic. It is never given internally, but is extensively used externally in the form of ointment. This, well known as Red Precipitate Ointment, is prepared by melting together Yellow Wax ʒ¼ and Almond Oil ʒ¾, and when the mixture is nearly cold adding finely powdered Red Oxide of Mercury gr. lxij., and mixing thoroughly. Vaseline forms an excellent basis for this ointment. It is a valuable application, but, applied to extensive ulcerated surfaces, occasionally causes ptyalism.

[1] Lond. Med. Record, Nov. 15, 1882.

1226. *Therapeutic Uses. In Indolent Syphilitic Ulcerations,* the red precipitate ointment is an excellent dressing, stimulating the surface, improving the quality of the discharge, and apparently hastening the healing process. It should not be applied over too large a surface at once, or the salt may become absorbed into the system, and induce salivation.

1227. *In Pruritus Pudendi,* an ointment composed of equal parts of this ointment and cod-liver oil is very successful when other measures have failed. *In Eczema,* when it has reached the dry stage, Sir E. Wilson places great faith in the red precipitate ointment. *In Favus,* he also speaks favourably of this ointment diluted with an equal weight of simple cerate. *Ringworm,* when occurring on the body or limbs, sometimes yields to its local use. The ointment has also been found useful as a dressing for the *Ulcerations of Rupia* and of *Frambœsia* or *Yaws.*

1228. *In Ophthalmia Tarsi, Chronic Conjunctivitis, and in some Chronic Affections of the Eye,* a small portion of the ointment smeared over the edges of the eyelids at bedtime is attended with great benefit. *In Purulent Ophthalmia,* according to Dr. De Condé,[1] it is often sufficient of itself to arrest the disease when employed early. He uses an ointment composed of 4 parts of red precipitate to 15 of lard and 15 of linseed oil. He regards it as the best remedy in the *Ophthalmia of new-born infants. In Gonorrhœal Ophthalmia,* Mr. Bader[2] found the following ointment highly serviceable: ℞ Hyd. Oxid. Rub. gr. j. Daturinæ (vel Atropinæ), gr. $\frac{1}{5}$, Petrolati (Vaseline), ʒj. M.

1229. HYDRARGYRI PERCHLORIDUM. Perchloride of Mercury. Corrosive Sublimate.

Med. Prop. and Action. Alterative in doses of from gr. $\frac{1}{16}$ to $\frac{1}{8}$. In bigger doses it causes much griping and purging, and in larger quantities it is a powerful irritant poison. When swallowed, it produces corrosion of the stomach; and in whatever way it may obtain entrance into the body, it occasions irritation of that viscus, and of the rectum, inflammation of the lungs and probably also of the heart, depressed arterial action, oppression of the functions of the brain, and inflammation of the salivary glands. (Christison.) In persons who have taken large quantities, it has been detected after death in the solids and fluids of the body. It appears to act powerfully upon the urinary organs, as in cases of poisoning by it the urine is extremely scanty in quantity, and after death the urinary organs are generally highly inflamed, whilst the bladder is extremely contracted. In prescribing corrosive sublimate, care should be taken not to combine it with any ammoniacal salts, as by their mixture in solution it is precipitated as ammonio-chloride, and though this precipitate would be dissolved in the stomach and produce its proper effect, the chance of its remaining as sediment at the bottom of the bottle renders ammoniacal solutions of mercury uncertain and unfit for internal use. Simple distilled water dissolves the perchloride sufficiently for this purpose. (Mr. B. Hill.[3]) Although ordinarily safe when externally applied, it is not free from danger; thus Dr. Meeres[4] records a case in which a solution (gr. ij., Aq. ʒj.), applied with a camel's-hair brush to the head of a child of nine years, for the cure of tinea, was followed by diarrhœa, profuse

[1] Ann. d'Oculistique, 1858, vol. xl.
[2] Lancet, May 1, 1880.
[3] Lancet, March 4, 1871.
[4] Lancet, Sept. 16, 1871.

salivation, prostration and death. Such an example inculcates the necessity of great caution in its use.

Dose:— Of the Perchloride, gr. $\frac{1}{16}$–$\frac{1}{8}$. *Of the Solution*, each fluid oz. contains gr. ss. of the salt.

1230. *Therapeutic Uses. In Syphilis* the perchloride is used by continental physicians in the early stages of the disease. It is the basis of Van Swieten's solution, represented by Liq. Hydrargyri Perchloridi B.P. In this country the perchloride is generally reserved for relapses that do not readily yield to Potass. Iod., as it is ill adapted for producing the requisite effect of mercury quickly; for if taken in sufficiently large doses to produce tenderness of the gums, it is apt to irritate the bowels. Hence it is better suited to the later forms of the disease, where the action of mercury is required only to a slight degree. A useful mode of giving it, especially for gouty persons, is to mix it with iodide of potassium, whereby a freshly formed solution of the biniodide of mercury is obtained :—℞ Hydrarg. Perchlor gr. $\frac{1}{16}$–$\frac{1}{8}$, Potass. Iod. gr. iij., Tinct. Cinchon. Co. ʒss., Spt. Chloroform ♏x., Aq. ad ℥j. To be taken two or three times a day after meals. For anæmic subjects it may be usefully conjoined with iron, thus :—℞ Liq. Hydrarg. Perchlor. ʒj., Liq. Ferri Perchlor. ♏x.–xx., Spt. Chloroform. ♏x., Aq. Menth. Pip. ad ℥j. M. To be taken thrice daily after meals. In the form of pill it is liable to be decomposed; hence it should be mixed solely with sugar of milk as the excipient: ℞ Hyd. Perchlor. gr. j., Sacchari Lactis (*q.s.*) M. ft. pil. 10. One to be taken two or three times a day. In three doses not exceeding $\frac{1}{4}$ or $\frac{1}{3}$ gr. per diem, it will be borne a long time without inconvenience. (Hill and Cooper, p. 415.) Its use hypodermically has been already considered (sect. 1197).

1231. *In Gonorrhœa and Gleet*, injections of a solution of the perchloride (gr. $\frac{1}{8}$–$\frac{1}{2}$, Aq. ℥j.) often prove effectual. *In Leucorrhœa*, a solution of this salt (gr. ij. Aq. ℥j.) may be used as a vaginal injection with great advantage. It should be used only once a day for the first two or three days, and subsequently two or three times a day, until heat and irritation occur, when lotions containing acetate of lead will effect a cure. It is only applicable to chronic cases.

1232. *In Sciatica*, which resists iodide of potassium (*q.v.*), try the perchloride (Liq. ♏lx.–lxxx.–gr. $\frac{1}{16}$–$\frac{1}{12}$) thrice daily. Very often it will be advisable to give cod-liver oil at the same time. (Anstie.[1])

1233. *Diseases of the Eye. In Scrofulous Ophthalmia*, Dr. Hamilton, of Dublin, found corrosive sublimate, in doses of from gr. $\frac{1}{16}$ to $\frac{1}{8}$ in decoction of cinchona, twice daily, very beneficial. The regimen and the state of the digestive organs should at the same time be carefully attended to.

1234. *Hemeralopia, or Night Blindness*, was successfully treated by Dr. Smith[2] with collyriums containing corrosive sublimate (gr. ij., Aq. ℥j.). This was dropped into the eye twice daily, and

[1] Med Times, June 13, 1874.

[2] Edin. Med. Journ. lxxiv. p. 24.

at the same time a blister was kept open on each temple. The only other remedies employed were mild aperients.

1235. *In Obstinate Skin Diseases, especially in those of a Syphilitic origin*, the perchloride may advantageously be given internally in one of the forms advised in sect. 1230, and applied externally in solution (gr. ij.–iij. Aq. ℥j.), or in the form of yellow-wash (*ante*). A two-grain solution is very effectual in allaying the intense itching in *Pruritis Pudendi*, *P. Scroti*, and *P. Ani*. These are often due to the presence of *Pediculi* (vulgo *crab-lice*), which it destroys more speedily and effectually than any other parasiticide. The same solution has likewise been found useful in various forms of *Acne*, *Tinea*, *Eczema*, *Porrigo*, *Pityriasis* (*Chloasma*), and *Urticaria*; but the fatal case mentioned above indicates the necessity of caution in its use. *Obstinate cases of Lepra and Psoriasis* often improve under its internal administration—viz., Decoct. Sarsæ Co. To *Onychia*, a strong solution has occasionally been locally applied with advantage, but it is inferior to arsenic or nitrate of lead. *In Frambœsia* or *Yaws*, the internal administration of corrosive sublimate, in doses of gr. $\frac{1}{10}$, is thought highly of by some West Indian practitioners; and although it is occasionally productive of benefit, it appears to be very inferior to the iodide of potassium (Maxwell). *To remove the Blueness of the Skin occasioned by a prolonged use of the Nitrate of Silver*, Sir Erasmus Wilson suggests the use of washes containing corrosive sublimate, but the safety of the remedy is doubtful.

1236. *In Hydrocephalus*, corrosive sublimate, in doses of from gr. $\frac{1}{30}$ to $\frac{1}{16}$, has proved successful in the hands of Dr. Merriman and some others. It has the effect of producing copious olive-green stools, and an increase of the urinary secretion. Sir T. Weisse relates one almost hopeless case, which yielded to $\frac{1}{12}$ of a grain every two hours. It appears to have no advantage over calomel (*q.v.*). *In the Threatenings of Apoplexy in old age*, comprising vertigo, confusion of ideas, and general embarrassment of the mental faculties, Dr. Headland[1] has found that half-drachm doses of the solution thrice daily, for three or four weeks, has a useful influence in removing these sensations.

1237. *In Dropsical Affections arising from Disease of the Heart, Liver, or Lungs*, corrosive sublimate is occasionally very efficacious. Dr. Pereira states that under its use he has repeatedly seen dropsical symptoms disappear. He advises from ♏xxx.–lx. of the solution every six hours; and adds that he has given it many days, and even weeks, without affecting the mouth.

1238. *In Hypertrophy of the Uterus*, Dr. Oldham strongly advises the internal use of corrosive sublimate, in doses of ℥j.–ij. of the solution, two or three times daily, in combination with a vegetable tonic or chalybeate. It rarely salivates. The reduction of an indurated womb is generally slow, but under the persevering use of this remedy, he states that six or eight weeks will suffice to absorb and soften a considerable hypertrophy. Blistering the sacrum or

[1] Lancet, Jan. 6, 1866.

inguinal regions greatly promotes the reduction. Dr. Graily Hewitt has employed this remedy with advantage in *Chronic Inflammation of the Uterus, attended with enlargement of the organ.* It should not be given in doses so as to salivate, and requires to be persevered in. He states that in small long-continued doses it also proves undoubtedly useful in the treatment of *Fibrous Tumours of the Uterus.* It need not exclude the employment of other means. For restraining the *Hœmorrhage dependent on the presence of fibrous or polypoid growths of the Uterus* the perchloride (gr. $\frac{1}{16}$ every six hours) sometimes succeeds when other remedies fail. Dr. Tanner relates such a case: it was the only remedy which had the effect of restraining the hæmorrhage, and the patient was more than once saved from death by its use. In those cases of *Amenorrhœa*, where other remedies fail to excite due secretion of bile, Dr. West (p. 44) states that he has seen small doses of the perchloride, continued for several weeks, conjoined with a tonic plan of treatment, of the most essential service.

1239. *In the treatment of Wounds*, and in the *dressing of cases after Operation*, corrosive sublimate has recently come into vogue. Dr. Koch showed that a solution of 1 in 20,000 was sufficient to destroy the bacillus anthracis, and Sir Joseph Lister[1] has in this country introduced corrosive sublimate as a dressing. Its use, however, needs careful supervision, as mercurialism has followed in some cases. In Germany, the perchloride has been largely used in surgical practice, but the drawback noticed above has at present restricted largely its use. In the treatment of *Parturients*, sublimate has been successfully employed.

1240. HYDRARGYRI SUBCHLORIDUM. Subchloride of Mercury. Calomel.

Med. Prop. and Action. *Alterative*, in doses of gr. ss.–j., either alone or as it occurs in Plummer's pill, which, however, is an untrustworthy preparation, owing to its insolubility. *Purgative*, gr. ij.–vj., in combination with jalap, scammony, and other purgatives. When it is wished to bring the system under the specific influence of mercury, the dose is gr. j.–ij., or more, frequently repeated, with a small portion of opium to prevent its passing off by the bowels. It is best given in the form of pill, with some inert confection. Externally it is applied in the form of ointment, or as a lotion, with lime water (*vulgo* black-wash), or in the form of powder. It is likewise used in the form of fumigation (*ante*). Calomel is the best salt of mercury for rapidly and certainly bringing the system under the influence of the metal, and is consequently preferable in all acute inflammations. Its *modus operandi* is imperfectly understood: a small dose evidently increases the activity of the liver and biliary organs, as is shown by the character of the stools which are produced by it; in doses of gr. xx., in acute dysentery, its sedative action is often very evident; and the benefit which arises from it in croup and other affections of the throat has led to the belief that it acts specifically upon the lining membrane of the trachea and larynx. No less certain and evident is its action on the salivary glands.

1241. *Therapeutic Uses.* *Acute Inflammation.* Although calomel has ceased to be resorted to in all cases of inflammation, even in that of serous membranes, there are forms of inflammatory disease—

[1] Lancet, Oct. 1884.

e.g. Iritis and *Retinitis*—in which it is productive of the best effects, even in the acute stages, and there can be little doubt that it possesses the power of promoting the absorption of the products of inflammatory action.

1242. *Fevers. In Typhus and Typhoid Fever*, mercury was at one time much employed, but has fallen into disuse. With reference to the former fever, Dr. Murchison states that he has seen many cases treated with it, but never with the slightest benefit. *In Typhoid (Enteric) Fever*, Dr. Murchison also states that, though mercury has been strongly recommended, he in his own experience has found it both useless and injurious. In the early stages of these fevers, however, if jaundice or other hepatic complication exist, a calomel purgative may be admissible; but its use should be restricted to the earliest stages, and here it has the recommendation of Wunderlich, Niemeyer, and other high continental authorities, who hold that it not only does good generally, but even helps to cut short the fever. In all cases the greatest caution in its use is requisite, and in the enteric form it is apt to act too powerfully as an irritant.

1243. *Malarial Fevers. In Intermittents*, mercury is wholly uncalled for, except as a purgative to remove fæcal accumulations or hepatic congestion, when these conditions exist. When quinine fails to make any impression on the fever, a brisk mercurial purgative is advisable, as its operation is often followed by the manifestation of its antiperiodic powers. When splenic enlargement coexists, mercury even as a purgative is inadmissible. *In the obstinate Intermittents of Childhood*, in tropical regions, I have used with the best effects a combination of Hydrargyrum c. Cretâ, Quinine, and Rhubarb.

The above remarks apply equally to *Remittent Fevers*. Speaking of the *Malarious Fevers of India*, Sir Joseph Fayrer (p. 112) observes: "In former days calomel was regarded as an essential part of the treatment, and large and frequent doses were given; an occasional dose of a few grains may be useful, especially where there are hepatic complications; but beyond this it is not required." Over *Bilious Remittent* or *Yellow Fever*, the mercurialists and anti-mercurialists have long waged violent warfare: the latter are now in the ascendant, and general opinion is in accord with that of Stillé (ii. p. 702), that the part of prudence is probably to abstain from mercurialization in yellow fever as in general use. Still there is much force in the remark of Dr. H. Wood (p. 467), that in these cases a mercurial purge, or several mild mercurial purges, will often, by exciting the action of the hepatic gland, be of great service in preparing the way for or aiding in the action of quinine.

1244. *Diseases of the Lungs. In Pleuritis* and in *Pneumonia*, calomel, either with antimony or opium, was formerly much in vogue, but now is seldom if ever used, at least as a resolvent treatment. As a purgative, mercury is very useful, as it tends to relieve the portal system, often overloaded in pneumonia. *In*

the Pneumonia of Children, Dr. Hillier considers that calomel is not to be recommended except as an occasional aperient.

1245. *Diseases of the Throat. In Croup*, mercury is a remedy of established value. With regard to its use Dr. W. Squire observes: "Calomel should be given from the first, and repeated frequently in small doses, interrupted occasionally for the administration of an emetic. Gr. ss.–j. of calomel, with gr. $\frac{1}{8}$–$\frac{1}{4}$ of ipecacuanha, according to the age of the patient, is to be prescribed every two hours; if the bowels become disturbed, it can be persisted with in diminished doses until its characteristic effect on their secretions is obvious, nor is it then to be entirely discontinued." It is not to be used to the exclusion of local and other general measures, especially the use of a hot (70°–75°) moist atmosphere.

1246. *In Diphtheria*, mercury was vigorously pushed by Bretonneau, but with very unsatisfactory results. From that time its use has been gradually discarded, and with such general consent that no one has since ventured to reintroduce it. (Morell Mackenzie, p. 161.) This is hardly correct, Dr. Hillier (p. 146) having as recently as 1868 advocated its claims, which, however, are not generally recognised by British practitioners.

1246*. *Diseases of the Brain and Membranes. In Simple Meningitis*, mercury, apart from its purgative effects, is a most valuable remedy. It should be administered in small and frequently repeated doses, so as to bring the system under its influence quickly, and this is best effected by combining with its internal administration the use of mercurial inunctions in the groin and axilla. Dr. Russell Reynolds, however, states that in *Cerebritis* he has never seen any good results from mercury given by the mouth or by inunction.

1247. *In Insanity*, mercury, once so highly thought of, is now abandoned. "If mercury be ever useful, and not mischievous, in the treatment of insanity," observes Dr. Maudsley, "it is when given in small doses of the bichloride in cases that are becoming chronic, or where there is a suspicion of syphilis. To administer mercury systematically in *general Paralysis*, as has been done, is as unaccountable in theory as it undoubtedly is pernicious in practice." *In Acute Mania*, Van der Kolk states that he has not employed calomel as a rule, and that he has sometimes seen salivation attended by an increase of cerebral congestion. "The less favourable action of this medicine induces, besides, a cachectic condition, and a sinking of the patient."

1247*. *In Hydrocephalus, Acute* and *Chronic*, mercury was formerly much relied upon, and Gölis's treatment of the chronic form by mercurial inunction to the shaven scalp, and calomel (gr. $\frac{1}{4}$–$\frac{1}{2}$) internally, is commended by Dr. Ramskill (Syst. ii. p. 403). Still, it has fallen into comparative disuse. Mercurialization *per se* is condemned by Dr. West (p. 104); whatever good, he remarks, he has seen in cases when calomel has been employed, has been effected when it was given in combination with purgatives, or when

it produced a purgative effect. In the *Convulsions of Childhood*, a single purgative dose of calomel often has a beneficial effect.

1248. *Diseases of the Eye. In Ophthalmia Neonatorum*, the introduction of finely-powdered calomel into the eye has been employed with marked success by Dupuytren, Kluge of Berlin, Van Siebold of Göttingen, and others. It is introduced into the eye by means of a camel-hair pencil loaded with the powder, which is shaken from it into the eye, while an assistant separates the lids. It may be employed at the earliest period of the disease, once a day in mild, twice a day in severe, cases. From one to two hours after the application the eyes may be washed with warm water; iodine and its salts should be avoided during its use. Dr. Wells speaks of having used with great advantage the insufflation of calomel in *Scrofulous Ophthalmia*, in *Opacities of the Cornea, and other Eye Affections of a Scrofulous nature*. This treatment is also favourably spoken of by Mr. Brudenell Carter in *Photophobia*.

1249. *In Purulent Ophthalmia*, the treatment by mercurials and antiphlogistics, formerly in vogue, has been found by experience to be less effectual than that by tonics, and has consequently been abandoned.

1250. *In Syphilitic Iritis*, mercury is admitted on all hands to be highly valuable; indeed, by some it is regarded as a specific. It is certain, however, that some mild cases will recover without mercury in any form, and that the local use of atropine in the earliest stages sometimes suffices to arrest the attack. Should this fail, should the congestion and local pain remain unabated, the pupil continue undilatable, and if the vision does not manifestly improve, mercury should at once be resorted to. In these cases, observes Mr. Brudenell Carter, it is found, as a mere matter of fact, that mercury, given rapidly but discreetly, until the gums show some slight signs of its constitutional effect, will at once break the chain of morbid action. From the very day on which the mercurial line becomes apparent, the sensations of the patient are relieved, and the symptoms of inflammation decline. He considers that its effect is quite as declared in *the Traumatic, or in the Rheumatic, as in the Syphilitic forms of Iritis*, and that the indication of its use is to be sought entirely in the severity or obstinacy of the attack, and not at all in the cause by which it is excited. *In Syphilitic Retinitis* it is of equal value as in iritis. In these cases calomel (gr. j.–ij.) or blue pill (gr. iij.) with opium (gr. $\frac{1}{4}$–$\frac{1}{2}$) may be given every four or six hours, and its operation aided by mercurial inunction, continued till the gums are affected or the disease yields.

1251. *Diseases of the Abdominal Viscera. In Diseases of the Liver*, no remedy has been employed so generally and indiscriminately as mercury; and up to a very recent period its cholagogue virtues were firmly believed in by the majority of the profession. The belief in its powers, however, has in a measure been upset by the experiments of Dr. Bennett; and apart from this, it has been superseded in the practice of many by podophyllum,

leptandrin, euonymin, and other similar agents, which are alleged to possess all the virtues without the disadvantages of mercury. Under these circumstances, there is a great chance of mercury, in hepatic affections, falling into undeserved neglect. There are cases—*e.g.*, *Congestion of the Liver*—in which a full mercurial (calomel) purgative is of undoubted utility. Under its administration the local weight, painfulness, and other symptoms, subside simultaneously with the occurrence of copious bilious stools, and it is impossible to disabuse the minds of those who have repeatedly witnessed these simultaneous effects of the idea that they bear an intimate relation one to another. The most plausible and probably the true explanation is that given by Dr. Murchison—namely, that mercury in these cases acts by irritating the upper part of the small intestines, propelling onwards the bile as fast as it flows into the duodenum, thus preventing its re-absorption, and that the biliary accumulations thus excreted constitute "the bilious stools" which have generally hitherto been regarded as the result of increased biliary secretion from the liver itself. But, as Dr. Murchison observes, if the calomel acted by stimulating the liver to increased secretion, it would be injurious in cases of hepatic congestion. In addition to the above explanation, Dr. Murchison considers that mercury may perhaps also act by stimulating the gall-bladder and bile-ducts to contract through reflex action. By adopting Dr. Murchison's hypothesis, it is easy to understand how it is that *Jaundice* sometimes yields rapidly to a calomel purgative (gr. v.) followed by a saline draught, and also how it will prove useless and probably injurious when the affection is connected with obstruction by gall-stones or organic disease of the liver. The best authorities agree in condemning the use of mercury, especially if carried to salivation, in the treatment of *Gall-stones*, and in jaundice connected therewith. The treatment of *Acute Hepatitis* by mercurialization is now well-nigh abandoned, and is replaced by local depletion by leeches (especially round the anus, so as to unload the portal system), sinapisms followed by fomentations and large linseed-meal poultices over the hepatic region, purgatives, especially salines, as sulphate of soda and magnesia, seidlitz powders, &c., which increase the watery exudation from the mucous membranes of the bowels; alkalies, together with colchicum, when there is reason to suspect that the affection is of a gouty nature. Perfect rest, with a mild nutritious diet (milk, beef-tea, and farinaceous articles), should be enjoined, and alcoholic stimulants and fermented liquors interdicted. *In Chronic Hepatic Affections*, all the benefit which could be expected from mercury is obtained more effectually, and with less damage to the constitution, from chloride of ammonium and iodide of potassium (*q.v.*).

1252. *In Acute Dysentery*, mercury was formerly regarded as indispensable, and was employed and recommended by the highest authorities in large (gr. xx.) and repeated doses. Experience, however, has shown that even the worst forms of the disease are curable without its aid, and that certain ill consequences follow its

employment; hence it has fallen into comparative disuse, except as an occasional aperient, its place being now filled by ipecacuanha (*q.v.*). In exceptional cases, however, should mercury be deemed advisable, recourse might be had to Annesley's pills (see IPECACUANHA), or to the following, which were found very effectual by Dr. Stewart:[1]—℞ Calomel. gr. ½, Morphinæ gr. ¼, Quininæ Sulph. gr. ij. M.; one pill to be taken every two or three hours. It should be held as an axiom that in the asthenic and scorbutic forms of dysentery, mercury in every form should be avoided. *In Chronic Dysentery* mercury is wholly uncalled for, excepting as a purgative when congestion of the liver is present, and even then it should not be repeated too frequently. *Obstinate Diarrhœa of Children*, which resists all other remedies, will sometimes speedily yield to small doses of calomel (gr. ss.–j.), given for two or three nights in succession at bedtime.

1253. *In Cholera*, calomel has for upwards of half a century been given in every variety and stage of the disease, in every gradation of dose, from one grain to sixty, in almost every possible form of combination, with the view by turns of obtaining its purgative, or its cholagogue, or its stimulant, or its sedative action, and the reported results have been of the most diversified and unsatisfactory character. The inutility, to say the least of it, of excessive doses is proved by Dr. Stilson's account of the epidemic at Malta in 1837, when the average mortality under scruple doses every half-hour or hour was 52 per cent. If the mercurial plan of treatment be determined upon, there can be no question but that preference should be given to Dr. Ayre's plan, which consists in prescribing gr. j.–ij. of calomel with ♏j.–v. of laudanum every 5, 10, or 15 minutes, omitting the latter when the dose has reached 60 or 80 drops. Dr. Ayre's success with this treatment was great, and it has been corroborated by others; but a great portion of the success may have depended upon his allowing the patient to drink freely of cold water (the colder the better), a practice that seems not only safe, but in the highest degree beneficial and grateful.

1254. *In Obstinate Constipation*, *Ileus*, and *Colica Pictonum*, a full dose of calomel, with or without opium, followed in a few hours by castor oil and a turpentine enema, often affords speedy and marked relief.

1255. *In Amenorrhœa*, mercury is spoken of by Dr. D. Davis as the most powerful emmenagogue existing. Dr. Graily Hewitt likewise states that it has appeared to him to do good in several cases in which he employed it. He directs that on two successive nights, at the time of the next expected period, a dose be given of calomel (gr. v.) and aloes (gr. vj.), followed by a seidlitz powder in the morning. It is inapplicable if the patient be very feeble. The cases of amenorrhœa requiring mercurialization are very rare; it should ever be borne in mind that, given in unsuitable cases, mercury is capable of doing serious mischief.

1256. *In active intractable Hæmorrhage*, mercury, carried to

[1] Indian Ann. of Med. Sci. No. ii. p. 132.

slight salivation, has been highly spoken of. Dr. Latham mentions a case of *Epistaxis* which resisted all ordinary remedies, but yielded immediately the mouth became sore. Dr. Southey also states that he has been taught by experience to rely upon mercury almost as a specific for obstinate hæmorrhage, whether attended by inflammation or not. Sir T. Watson adds: "Whatever may be the *modus operandi* of mercury, the fact is certain, that hæmorrhage which has resisted all other modes of treatment, has, in very numerous instances, ceased at once upon the occurrence of a moderate degree of salivation."

1257. *In Dropsical Affections*, mercury should be given with much caution. "When," observes Sir T. Watson, "ascites is passive, when the distension of the peritoneum has crept on without pain, fever, or other marks of inflammatory action, our first and best hope of evacuating the fluid will rest upon diuretics. Drastic purges may also be employed. If these remedies fail, and we suspect hepatic disease, it will be proper to give the patient the chance of the remedial influence of mercury." It is best given in combination with digitalis and squill. *In Dropsy*, depending upon granular disease of the kidneys, it is injurious, and it should be administered with great caution to the aged, the cachectic, or the scorbutic. *In Ovarian Dropsy* it is of little value, and small dependence is to be placed upon its powers in *Hydrothorax* or *Hydropericardium*.

1258. *In Diseases of the Skin*, partaking of an inflammatory type or of syphilitic origin, mercurial preparations are indicated. Of these, calomel ointment (℥j. ad Ung. ℥j.) is one of the best. Pereira, speaking of this ointment, remarks that if he were required to name a local agent pre-eminently useful in skin disease generally, he should fix upon this. It has been found especially useful in *Lepra*, *Psoriasis*, *Acne*, *Herpes*, *Impetigo*, and *Eczema*. It is also very effectual in *Pruritus Ani*, and likewise for *Pruritus of the Scalp, connected with Chronic Eczema and Pityriasis. In dry Eczema* (*Eczema siccum*), *Psoriasis*, and *in Syphilitic Eruptions*, Dr. McCall Anderson[1] advises the following:—℞ Hyd. Subchlor. ℥j., Ung. Hyd. Ammon. ℥ij., Glycerini ℥j., Ung. Simpl. ad ℥j. M. To be rubbed firmly on the eruption twice daily. In the use of all mercurial preparations in skin diseases it should be remembered that to a certain extent they are absorbed, and that salivation is a contingency to be expected, if applied to too large a surface, or if too long continued.

1259. *In Lupus* which resists other remedies, or which has improved up to a certain point under the use of arsenic, and there is a threatening of relapse, mercury may be tried. *In Lupus Erythematodes* and allied affections, Dr. McCall Anderson states that he can confirm the opinion of Dr. Moriz Kohn, of Vienna, as to the value of Emp. Hydrargyri. A piece of lint, the size of the part, is spread with the melted plaster, and applied and changed once daily.

[1] Lancet, Dec. 4, 1869.

1260. *To Chancres and Syphilitic Ulcers of all kinds* the black wash is a most serviceable application. It should be applied fresh on linen or lint several times a day, and the mixture should be well shaken before each application. A very effectual mode of treating *Syphilitic Condylomata about the Anus* consists in washing the parts twice daily with solution of chlorate of soda, drying them, dusting them with calomel, and separating them with a piece of clear dry lint. (Dr. McCall Anderson.[1]) *For Syphilitic Fissures and Cracks of the Skin, especially about the lips, nose, and ears,* a very useful application is calomel cream, made by incorporating ʒj. of calomel with ʒij. of olive oil, and adding sufficient lard to make a cream; to be applied with a camel-hair brush. (Hill and Cooper, p. 345.)

1261. *In Cancrum Oris,* the black-wash, locally applied, is occasionally signally beneficial. It should be used chiefly in the earlier stage of the disease, and the ulcer should be frequently cleansed with the lotion.

1262. HYDRARGYRI UNGUENTUM. Mercurial Ointment. Blue Ointment.

Med. Prop. and Action. Used externally, either as a local or as a constitutional remedy. It forms the basis of the following preparations:—1. *Compound Ointment* (Oint. of Mercury, ʒvj., Yellow Wax, Olive Oil āā ʒiij., Camphor ʒjss.; 2. *Liniment* (Oint. of Mercury ʒj., Sol. of Ammonia, Lin. of Camphor āā fʒj.); and 3. *Suppositories* (Oint. of Mercury gr. lx., Benzoated Lard, White Wax āā gr. xx., Oil of Theobroma gr. lxxx., divided into twelve equal parts). Inunction with Ung. Hydrarg. is a valuable adjunct to the internal use of mercury when rapid salivation is desirable.

1263. *Therapeutic Uses. In Syphilis,* the introduction of mercury into the system by inunction is much practised on the Continent; but it has not been generally adopted in this country, on account of its uncleanliness and other inconveniences. (See sect. 1197.)

1264. *In Subacute Synovitis,* especially of the knee-joint, where there is much fluid, the treatment which has proved most successful in the hands of Mr. W. Adams[2] is inunction of strong mercurial ointment to the locally blistered surface; the dressing to be continued so long as the blistered surface remains unhealed. Occasionally, healing takes place very rapidly; in such cases a dressing of equal parts of mercurial and savine ointment is preferable. *In purely chronic cases* with much thickening, he prefers Scott's dressing (Cerat. Hydrarg. Co. L. Ph.) This cerate, with pressure and complete rest, formed the treatment which obtained so high a name for the late Mr. Scott, of Bromley. Dr. Fuller speaks favourably of mercurial inunction to a locally blistered surface in *obstinate Affections of the Joints consequent on Rheumatic Gout.*

1265. *In Indurations and Enlargements of the Testicles, and in Orchitis,* inunction of this ointment is a local measure often attended with the best effects. Hill and Cooper (p. 556), however, place no faith in it in orchitis, preferring collodion (*q. v.*).

1266. *In Inflammation of the Uterus,* Dr. West (p. 106) limits

[1] Lancet, Dec. 4, 1869. [2] Lancet, Jan. 6, 1866.

the use of mercurials to the advanced stage, in which enlargement of the womb and induration of its tissues are apt to supervene, and of these he gives preference to the perchloride: as an external application, especially where there is *Ovarian Enlargement*, he advises the following:—℞ Ung. Hydrarg. ʒvj., Camphor. gr. xl.; Ext. Bellad. ʒij. M. ft. Ung.; to be rubbed on the affected side twice daily.

1267. *In Syphilitic and ordinary Warts*, Professor Unna[1] recommends the continuous application of Ung. Hydrarg. containing 5 per cent. of arsenic: it acts by causing their absorption.

1268. Hydrargyrum cum Creta. Mercury with Chalk. Grey Powder.

Med. Prop. and Action. Alterative in doses of gr. j.–iij.; aperient, gr. v.-x. for adults, gr. j.–v. for children. It is rendered slightly antacid by the presence of the chalk. It may be combined with rhubarb and cinnamon, and also with alkalies. It is a mild, unirritating preparation, and particularly adapted for children. It should be given in sugar, syrup, or some viscid fluid.

Dose, gr. iij.–v.

1269. *Therapeutic Uses. In the Diarrhœa and Dysentery of Children*, when the stools are clay-coloured, or mucous and sanguineous, the following formula is particularly useful:—℞ Hyd. c. Cret. gr. ij.–iij., Pulv. Aromat. vel P. Cretæ Aromat. gr. iij. M. To be taken twice a day. Sir T. Watson prescribes the following:—℞ Hyd. c. Cret. ʒss., Pulv. Cretæ Co. (Ph. Lond.), Sodæ Carb. Exsic. āā ʒj. M. Dose, gr. iij.–v. thrice daily. He advises its use particularly when *Aphthæ* exist in the mouth, borax being used as a local application. In small doses (gr. $\frac{1}{3}$) every two or three hours, it is often very effectual in relieving *Obstinate Vomiting in Infants and Young Children*, whether associated with diarrhœa or not. *In the Diarrhœa of Phthisis*, half-grain doses of grey powder are occasionally effectual in checking the discharge.

1270. *In Quinsy and Scarlatina*, when the *enlarged Tonsils* almost meet and block up the passage, impeding digestion and respiration to even a dangerous degree, Dr. Ringer states the gr. $\frac{1}{3}$ of Hyd. c. Cret. taken every hour greatly reduces the swelling in a few hours, and obviates the distress and danger. Even if an abscess has formed, its maturation and evacuation appear to be effected more quickly. *In Mumps* also, he states the same dose three or four times daily speedily relieves the swelling and pain.

1271. *In Syphilis Infantum*, grey powder is the best form of mercury for internal use. It may be continued for a considerable period without giving rise to gastric irritation. *In the Syphilitic Eruptions of Children*, Dr. Hillier states that the treatment he prefers is to give Hyd. c. Creta gr. j. twice or thrice daily, with syrup of iodide of iron. Chlorate of potash, he adds, without mercury, will sometimes do good, but it is not so effectual as mercury. *In Syphilis in the Adult*, Mr. Acton and others prefer grey powder to the stronger forms of mercury.

[1] Practitioner, Dec. 1882, p. 368.

2172. HYDRASTIS CANADENSIS. Golden Seal. The rhizome of a Ranunculaceous plant, long in use in N. America, having been a vaunted remedy for cancer among the Cherokees.

Med. Prop. and Action. The rhizome has a rich yellow colour, formerly used as a dye. It possesses a bitter taste, and contains a resinoid substance called Hydrastin, which is composed of the alkaloids Hydrastin and Berberin. It occupies a place in the first rank of the U.S. Pharmacopœia, being used as a stomachic, tonic, and antiperiodic.

Mode of Administration. A tincture (1 in 10) is used in ʒss.–j. doses. A fluid extract (American) ♏x.-xxx. The resin, gr. iij. to vj., which may be given in glycerine of Tragacanth and powdered Acacia. The dose of the alkaloid is gr. j.–ij.

The physiological action of Hydrastis is unknown save as far as the researches of Rutherford go. While salivary secretion is increased, the activity of the liver becomes markedly promoted, as is that of the intestines, although in a lesser degree. Dr. Phillips regards Hydrastis as possessing properties very closely akin to those of quinine.

1273. *Therapeutic Uses. In Dyspepsia and want of tone of the Alimentary tract,* Hydrastis possesses undoubted value as a bitter stomachic and tonic. And as it exercises a decided action upon the liver and intestines, it will prove useful in many cases of *Gastric Feebleness*, with its common accompaniments, *Sluggish Liver* and *Confined Bowels.*

1274. *In the treatment of Alcoholism,* Hydrastis is most valuable: it supplies the craving want felt by the patient, and at the same time gives tone to his digestion,

1275. *Habitual Constipation* with *Dyspepsia* will often yield to ʒss. doses of the tincture of Hydrastis in abundance of water, every four hours.

1276. *Hœmorrhoids* and *Prolapsus Ani* are benefited, and the *Hœmorrhage* often controlled by this remedy. It is frequently advisable to supplement the internal use by injections of a weak infusion.[1]

1277. *Intermittent Fevers.* According to Dr. Bartholow, the power of Hydrastis is as marked as is that of quinine, sharing with that drug a power of controlling intermittent and malarial fevers in general.

1278. *Discharges from Mucous Membrane, Leucorrhœa, Otorrhœa, Conjunctivitis, Ozœna,* are all improved by Hydrastis.

For *Gonorrhœa,* Hydrastin (ʒj. to ℈iv., Bartholow), or T. Hydrast. ʒij.–iv. Aq. Oj. (Phillips), forms a useful injection.

1279. *Cracks, Fissures, &c., about the Nipple* are, it is said, cured by Hydrastis. It is further recommended for chronic ulceration of the leg, &c.

1280. HYDROBROMIC ACID DILUTE. Acidum Hydrobromicum Dilutum. Introduced into the B. Ph. of 1885, under the name of Acidum Hydrobromicum Dilutum, and prepared from Bromine ℈j., Water and Sulphuretted Hydrogen, of each a sufficiency.

Med. Prop. and Action. A colourless, inodorous liquid, having a sour taste and acid reaction. It was discovered in 1826 by Balard. From the researches of Reichert,[2] it would appear that its physiological action approximates closely

[1] Brit. Med. Journ. 1880, p. 747. [2] Bost. Med. and Surg. Journ. civ. 505.

to that of potassium bromide, lessening, or even abolishing, reflex action; but it possesses the advantage that it is less liable to produce symptoms of bromism. Large doses act as a depressant upon the heart and voluntary muscles, while the acid in small quantities stimulates. It is useful in medicine as a sedative, and possesses valuable properties.

Dose, ♏xv.–l.

1281. *Therapeutic Uses. In Tinnitus aurium* and *Cinchonism*, the acid relieves, and if administered with quinine it prevents, the troublesome singing in the ears and interference with vision.

1282. As a sedative in cases of *Overworked Brains*, and as a substitute for bromide of potassium, hydrobromic acid answers well.

1283. In *Nervous Affections* of the respiratory system, *Hooping-cough*, *Nervous Cough*, it is also of much service. In *Reflex Vomiting* some authorities extol the use of this preparation. It is necessary, however, to caution against its employment in *Epilepsy*, as it seems to possess the curious property of increasing the frequency and severity of the fits.

1284. Hydrobromic Ether. Ethyl Bromidum. Bromide of Ethyl.

Med. Prop. and Action. Anæsthetic alike when inhaled and when applied locally. It is prepared from a distillation of alcohol, bromine, and phosphorus; colourless, with a peculiar odour and sweetish taste; it is highly volatile, and readily decomposes, liberating free bromine. Mr. Nunneley, of Leeds, made repeated trials of this anæsthetic, and spoke very favourably of its use. However, his subsequent experience, coupled with that of others, goes to show that while bromide of ethyl is less pleasant to the patient than is chloroform, it is none the less dangerous. Anæsthesia is very rapidly induced (two to three minutes), and consciousness speedily returns. Its mode of action seems quite similar to that of chloroform. Two deaths have arisen from its use.

1285. *Therapeutic Uses.* To produce *Anæsthesia.* When inhaled, unconsciousness rapidly occurs. Precisely similar precautions in its administration must be taken as with chloroform.

1286. *As a local Anæsthetic*, bromide of ethyl is used in the form of a spray from an atomiser. It is alleged to give relief from migraine.

1287. Hydrochloric Acid. Acidum Hydrochloricum. Muriatic Acid. Acidum Hydrochloricum Dilutum. Diluted Hydrochloric Acid.

Med. Prop. and Action. The strong acid is a powerful caustic and escharotic. For internal use, the dilute acid, in doses of ♏x.–xx. in any bland fluid, acts as an antalkaline, stimulant, tonic, and mild laxative. In long-continued doses it is alterative and tonic, and improves the tone of the digestive organs. From its injurious action on the teeth, it is advisable to wash the mouth out with an alkaline solution immediately after its employment, either internally, or locally to the fauces. As a disinfectant it has long enjoyed considerable repute. Dr. J. Dougall,[1] who has made the subject of the acids as disinfectants his special study, states that hydrochloric acid (1 part of the strong acid to 20 of water) is used chiefly to *disinfect typhoid excreta*, and the bed and *clothes of persons with infectious diseases.* In typhoid cases, a large cupful of the fluid is put into the vessel before it is used. After being emptied down the water-closet it is

[1] Brit. Med. Journ. Nov. 15, 1879.

rinsed with another cupful, which is also at once put down the closet, the water running while this is being done. In using the fluid for clothes, these only require to be sprinkled with it so as to sensibly damp them, allowing them to remain so for about four hours, but of course saturation for about an hour is preferable. With thick woollen clothes, such as blankets, an inconveniently large quantity of the acid fluid is needed for saturation. Woollen articles require to be subject to the disinfectant process longer than linen or cotton ones. Boiling water is afterwards poured over the acidified clothes, and after an hour's immersion they are thoroughly rinsed with warm water till all the acid is got rid of, when soap with soda or potash may be used to wash them. If the acid be not removed, the soap will not form a lather. The acid solution may also be used for sprinkling on floors, pouring down sinks, &c. Used as directed above, the acid does not damage the metallic fittings of the water-closet. The cheapness of the acid is no mean advantage.

Dose of Acid. Hydrochlor. Dil., ♏x.–xxx. freely diluted.

1289. *Therapeutic Uses. In Atonic Dyspepsia*, Dr. Wilson Fox speaks highly of the value of hydrochloric acid, and its utility is easily comprehensible from its being probably the most active agent in the normal process of digestion; ♏xv.–xx. of the dilute acid, properly diluted, should be given immediately before or during or directly after a meal. It may be advantageously combined with vegetable bitters. In milder cases of *Acid Vomiting* or *troublesome Heartburn of Pregnancy*, and also in *Nervous Disorder of Digestion associated with Diarrhœa*, he has found benefit from a combination of this acid and tincture of Nux Vomica. It should be given before meals.

1290. *In Gout*, Dr. J. F. Duncan describes the treatment by hydrochloric acid as pre-eminently safe and beneficial; he considers that it acts more directly upon a primary cause of the disease—the presence of lithic acid in the blood—and that it holds out a greater prospect of effecting a real cure than any antacids. He employs the following mixture :—℞ Acid. Hydrochlor. Dil. ʒjss., Spt. Chloroformi ʒij., Tinct. Colchici ʒj., Infus. Cascarill. ad ℥vj. M. Dose, ʒj. every three hours. It must, however, be pointed out that as Dr. Duncan employs colchicum, it is hard to believe that the hydrochloric acid possessed especial merits in the treatment he advocates.

1291. *In Typhoid Fever*, the mineral acids, according to Dr. Murchison (p. 570), are often of real service, though their powers have been overrated. He prefers hydrochloric and sulphuric acids: ♏xv.–xxx. of the dilute acid every 3 or 4 hours, with gr. ss. of quinine when the fever presents anything of a remittent character. The value of hydrochloric acid is also attested by Dr. Chambers.[1] On the other hand, Dr. G. Johnson[2] thinks cases of typhoid do better when the acid is omitted; it seemed to him to irritate the bowels and cause diarrhœa. To allay the thirst in mild cases of *Typhus*, Dr. Buchanan is of opinion that there is no better medicine than dilute hydrochloric acid (♏xx.) and water (ʒj.)

1292. *In the continued Fevers of Childhood*, it appears to have a beneficial influence. In the advanced stages, after the second week,

[1] Med. Times, vol. ii. 1861, p. 526. [2] Brit. Med. Journ. vol. i. 1875.

when the vital powers are much depressed, Dr. West recommends the following :—℞ Acid. Hydrochlor. Dil. ♏xxxij., Spt. Æther. Co. ♏lxxx., Syr. Rhœad. ℥iv., Mist. Camph. ℥iijss. M. Dose, f℥iv. every 6 hours for a child æt. five years. It is inadmissible if there be severe abdominal symptoms, in which case he substitutes Dover's powder gr. j.–jss. at bedtime, which has the double advantage of checking a tendency to diarrhœa and of procuring sleep. Nutritives and stimulants (wine) should be employed as required. *In Scarlet Fever*, hydrochloric acid largely diluted has the recommendation of several American physicians.

1293. *In the chronic stage of Hooping-cough*, hydrochloric acid in large doses (f℥ij.–vj. daily) has been recommended as a specific, but it is better to give it in moderate doses as advised by Dr. West (p. 443) :—℞ Acid. Hydrochlor. Dil. ♏xxxij., T. Opii ♏iv., Syr. Mori f℥iv., Aq. ℥ijss. M. Dose, f℥iij. thrice daily for a child æt. two years.

1294. *In Diphtheria*, when the whole of the false membrane is visible, and its margins within reach, it is said to be useful to paint the part and the surrounding mucous membrane, to which the disease is spreading, with a mixture of equal parts of strong hydrochloric acid and honey. It sometimes arrests the local spread of the disease. Dr. Hillier prefers this caustic to nitrate of silver. Where there is much redness and pain, Dr. Squire recommends that the acid, diluted with five parts of water, should be pencilled over the whole surface. This, he states, tends to prevent further exudation, and affords relief to the local discomfort.

1295. *In the Ulcerated Sore-throat of Scarlet Fever*, Dr. Hillier advises the acid and honey (*ante*) to be applied every third day, a concentrated solution of the chlorate of potash (*q.v.*) being used as a gargle in the intervals. As an internal remedy in *Scarlatina* it has been successfully employed by some American physicians.

1296. *In Cynanche Maligna or Putrid Sore-throat*, also in *Gangrenous Stomatitis and Cancrum Oris*, the local application of the pure acid has been employed successfully in arresting the ulcerative process, but on account of its powerful action the greatest caution is necessary, in order to limit its application to the diseased parts. In mild cases it should be diluted with an equal weight of honey. *In Aphthous Ulceration of the Mouth in Children*, 1 part to 8 is sufficiently strong, and often produces excellent effects.

1297. *In Oxaluria*, hydrochloric acid has been long in repute, and proves useful in remedying the dyspepsia and mental depression which so often accompanies this malady. In *Cystic Oxide-* and *Phosphatic-Deposits* with *Alkaline Urine* it is also useful, and has sometimes been injected into the bladder (♏ij. Aq. ℥iv.) for its local effect (Phillips, p. 256).

1298. *In Phlegmasia Dolens*, Dr. Mackenzie[1] directs f℥j. of the diluted acid in Oij. of barley water, with f℥ss. of chlorate of potash, to be taken daily.

[1] On Phlegmasia Dolens, 1862.

1299. Hydrocyanic Acid. Acidum Hydrocyanicum. Prussic Acid. Diluted Hydrocyanic Acid. Acidum Hydrocyanicum Dilutum. Hydrocyanic Acid dissolved in water.

Med. Prop. and Action. The pure acid is so powerful a sedative poison, that small animals made to breathe air saturated with its vapour died at periods varying from one to ten seconds. A single drop placed on the tongue of a rabbit killed it in eighty-three seconds; and three drops applied to the eye of a cat, caused death in twenty seconds. (Christison.) So powerful a poison is evidently entirely unsuited for ordinary medicinal purposes. The diluted acid is a powerful and direct sedative in doses of gutt. ij.–iv.–vj., but the smaller dose should be always given at the commencement. Prussic Acid has some effect on the brain, causing giddiness and slight stupor; the respiratory centre in the medulla next becomes weakened, and the motor nerves are more or less paralysed, causing excessive muscular feebleness. The respiration becomes slow and irregular, and finally ceases, death in cases of poisoning being generally due to suffocation. It has likewise a powerful action on the heart, the circulation becoming slow, feeble, and irregular under the influence of poisonous doses, and this arises both from an influence on the nerves and on the muscular structure of the heart itself. It also acts directly on the blood, combining with the hæmoglobin of the red corpuscles, and preventing them from properly fulfilling their duty of carrying oxygen to the tissues. It has no special influence on the temperature or on secretion, save that the saliva is generally increased in quantity. In large or poisonous doses it kills immediately, the victim frequently uttering a loud cry, and expiring from cardiac syncope. (Farquharson, p. 60.) From the researches of Dr. Amory[1] it appears that death in these cases is due to some alteration, either physical or chemical, in the condition of the blood. Externally applied (f℥ij. of the diluted acid, in f℥x. of water), it is sedative and anodyne. Care should be taken not to apply it to an ulcerated or denuded surface, as it becomes, when thus applied, absorbed into the system, and may produce serious and even fatal effects.

In poisoning by Hydrocyanic Acid, according to M. Preyer,[2] artificial respiration, immediately applied, is very frequently a perfect remedy; and further, that in atropine, in very small doses (gr. $\frac{1}{75}$?) subcutaneously injected, as soon as possible after the ingestion of the acid, we have a true physiological antidote. In the treatment of poisoning by this acid, the first object should be to support life by all means in our power, for, as Dr. Ringer (p. 552) observes, "hydrocyanic acid passes very speedily into the blood, and is as speedily eliminated; hence if life can be supported for half an hour, the patient is generally safe."

Dose:—Of the diluted Acid ♏ij.–viij. "Scheele's Acid," from its varying strength, should be discarded in practice; it is about twice the strength of the officinal acid. It is rarely, if ever, advisable to carry the dose to the full extent directed in the P.B.

1300. *Therapeutic Uses. Simple Nervous Cough*, apparently independent of pulmonary disease, is sometimes of great urgency and violence, and while it seems to be kept up by an irritable state of the system, appears to be aggravated by opiates and the usual expectorant remedies. For this affection there is no more certain palliative than hydrocyanic acid (Stillé). *In the Cough of Phthisis* it often forms a valuable adjunct to ordinary cough mixtures, especially when the system is irritable, and any spasmodic symptoms are present. Under the same circumstances it seems to possess

[1] Practitioner, April 1872. [2] Practitioner, Aug. 1868.

some power in controlling *Hæmoptysis*. There is much evidence, especially adduced by Dr. H. Roe, to prove that it is a powerful remedy in *Hooping-cough;* there are, however, other remedies quite as effectual and far more safe—*e.g.* belladonna.

1301. *In Dyspepsia, attended with Gastric Irritation*, hydrocyanic acid, in doses of ♏ij.–iv., combined with infusion of calumba, is often signally useful, allaying irritability of the stomach, and thereby inducing a slower and consequently a more healthy secretion of gastric juice. *In the Irritative Dyspepsia of Phthisis*, Dr. Wilson Fox states that he has found no remedy so efficacious as this acid, given with carb. of potash or soda, in infusion of calumba, twice or thrice daily, in the intervals of meals. *In Subacute Gastritis*, it often proves useful, given in an ordinary effervescing draught. Speaking of its use in *Gastrodynia*, Sir T. Watson states that he has seen more rapid and decided relief afforded by hydrocyanic acid than by anything else, and that the cure so wrought is often permanent. *In Gastralgia and Enteralgia*, it is often productive of good results, given in conjunction with bismuth.

1302. *Vomiting*, arising from many morbid conditions, is often speedily relieved by hydrocyanic acid, given in an effervescing draught. Even in that attendant on *Ulcer of the Stomach*, according to Dr. Brinton, it sometimes is effectual, either alone, or with the effervescing mixture of the citrate of potash.

1303. *In Skin Diseases*, to allay distressing pruritus, lotions containing hydrocyanic acid are often very effectual; either of the following may be used:—℞ Acid. Hydrocyan. dil. ʒiv., Aq. Dest. ʒviij., Alcohol ʒiv., Plumbi Acet. gr. xvij. M. f. lotio. Or, ℞ Acid. Hydrocyan. dil. ♏x.–xl., Glycerini ʒj. M. It proves especially useful in *Urticaria*, *Lichen Tropicus* (*"Prickly Heat"*), *Eczema*, and *Impetigo*. *In Pruritus Pudendi*, Dr. West speaks of the acid, largely diluted, as a valuable application. Some caution is necessary in its use; the stronger formula (*ante*) should not be applied over a large surface, and the patient must be warned not to use it too freely, as there is danger of its becoming absorbed. It should never be applied to abraded surfaces.

1304. *In Neuralgia*, Dr. Fuller has often found the following application useful:—℞ Acid. Hydrocyan. dil. ʒss., Glycerini, Aq. Rosæ, āā ʒij. M. This should be painted over the seat of pain with a camel's hair brush.

1305. Hyoscyamus. Hyoscyami Folia. Henbane Leaves.

Med. Prop. and Action. Narcotic, anodyne, and anti-spasmodic, its activity residing principally in an alkaloid, *Hyoscyamina*. According to the researches of Dr. Harley, hyoscyamus or its alkaloid, given in small doses, and such as are insufficient to produce positive dryness of the mouth, rapidly subdues ordinary excitement of the pulse, and reduces it within an hour or two to its slowest state—namely, to that condition in which it may occasionally be found after a long period of complete rest of mind and body—*e.g.* to 50 or 45. It was never observed lower than 42. After doses ($\frac{1}{16}$–$\frac{1}{12}$ gr. of Hyoscyamine introduced hypodermically) sufficient to produce complete dryness of the tongue and hard and soft palates, the pulse will generally experience an acceleration of 10 or 20 beats, and be increased slightly in force and volume. This accelera-

tion rarely lasts an hour; the pulse then slowly declines, and usually decreases about five beats for every interval of 20 or 30 minutes, until at the end of from an hour and a half to two hours, it attains its minimum rate. Apart from these effects on the pulse, the following symptoms will be observed, after moderate doses (grs. $\frac{1}{30}$-$\frac{1}{24}$ of the alkaloid). In 10 or 20 minutes from the time of injection, the tongue becomes more or less completely dry, rough and brown; the hard and soft palates dry and glazed; excessive giddiness, and a weight across the forehead, somnolency, the cheeks a little flushed, and the membranes of the eye sometimes slightly injected. After continuing for about an hour, these symptoms pass off, and the tongue and palate become covered with a sticky and offensive secretion, agreeing in all respects with that observed after the action of belladonna. The pupils slowly dilate during the latter part of the action of the medicine, and at its close attain their maximum degree of dilatation. If larger doses than $\frac{1}{15}$ gr. be given, the above symptoms will be increased in degree, and prolonged for two or three hours; and they will be accompanied either by wakeful, quiet, and usually pleasing delirium, with illusions of the sight, or with such excessive somnolency that the patient cannot keep the eyelids raised for a few seconds, but when aroused, lapses again into a dreamy sleep, broken by occasional mutterings and slight jerking of the limbs. In either case, the power of maintaining the erect posture will be lost, and at best the patient reels like a drunken man. Like atropine, hyoscyamine is eliminated by the kidneys, and has been detected in the urine twenty-two minutes after the hypodermic injection of gr. $\frac{1}{15}$ of the alkaloid. The researches of Dr. S. Pearse[1] and others have confirmed the similarity in action and uses between hyoscyamine and atropine. When taken by the mouth, hyoscyamus, or its active principle, produces exactly the same effects as when the latter is introduced into the system hypodermically; they are fully developed about an hour after the ingestion of the medicine. In its action upon the system, hyoscyamus appears to be intermediate between opium and belladonna, possessing as it does, on the one hand, powerful somniferous properties second only to opium itself, and on the other, an influence on the sympathetic nervous system, as indicated by the pulse, secondary only, when given in large doses, to that possessed by belladonna itself. Compared with belladonna, it is distinguished by a preponderance of deliriant or somniferous properties. Compared with opium, it agrees, on the one hand, very closely with that drug in its cerebral effects, provided we take a wide view of both medicines upon the system; whilst, on the other, its influence upon the pulse, upon the mucous membrane of the mouth, and the pupil, place it in strong contrast with that drug. In addition to its cerebral and sympathetic effects, henbane has a powerful depressant influence upon the motor function, and thus comes into relation with conium. Locally applied to the eye, it causes dilatation of the pupil equally with atropine. The diagnosis and treatment of poisoning are identical with those of belladonna.

Dose:—Of the Extract, gr. iij.-vj. *Of the Tincture*, ♏xx.-lx. *Of Amorphous or Uncrystalline Hyoscyamine*, gr. $\frac{1}{8}$-$\frac{3}{8}$, increased to gr. j. *Of the sulphate* gr. $\frac{1}{120}$-$\frac{1}{40}$, gradually increased. *For Hypodermic Injection*, the sulphate of hyoscyamine gr. j. distilled water ʒij., of which the dose is ♏j.-iv. See also sect. 1308. Hyoscyamine is a most unstable alkaloid, and soon decomposes: heat renders it almost inert. Given internally, its action is very uncertain, and sometimes dangerous; hence the hypodermic use of it presents a marked superiority over other modes of administration (Dr. T. Browne).

1306. *Therapeutic Uses. In functional Disturbance of the Heart*, arising from emotion, henbane is specially indicated, but to be effectual it requires to be given in large doses. Dr. Harley states that, in these cases, the subcutaneous injection of gr. $\frac{1}{48}$ of sulphate of hyoscyamine exercises a most speedy and beneficial

[1] Lancet, Sept. 2, 1876.

influence. He also states that in *Cardiac and Pulmonary Asthma* it is the appropriate remedy, and when used subcutaneously will often bring immediate relief.

1307. *In Sleeplessness*, Dr. M. Fothergill[1] observes that henbane takes place alongside of opium, and may be resorted to where opium or morphine disagrees, as in chronic renal disease; he advises its combination with bromide of potassium. It has the recommendation of Sir W. Jenner,[2] in the *Sleeplessness of Typhoid Fever*.

1308. *In Insanity of a Sthenic type*, and in *Acute Delirious Mania*, henbane is indicated, and, equally with digitalis, is far preferable to opium. Dr. Maudsley advises the tincture in drachm doses; if this has no effect, then fʒij., or even more, may be given safely. Dr. F. Blandford prefers the extract, gr. x.–xv., given in the fluid form. (See DIGITALIS.) Dr. Robert Lawson, who has studied hyoscyamine and physostigmine in their physiological relations, as well as their employment in medicine, as sedatives and hypnotics, finds hyoscyamine one of the best methods of treating the *restless violent Delirium* of acute mania.[3] It has also been employed in *Subacute* and *Recurrent Mania*, *Monomania of Suspicion*, the *Excitement of Senile Dementia*, the *Epileptic state*, the *Excitement* of *General Paralysis of the Insane*, and other forms of *Cerebral Disease*. Dr. Lawson used the following mixture:—℞ Hyoscyamine gr. j., Sp. Ether. ♏viij., Alcohol ♏xxiv., Aqua font. ad ʒj. M. ut fiat haustus. It may also be administered hypodermically.[4] The value of hyoscyamine in *Mania*, attested by the researches of Dr. R. Lawson, Dr. Ringer and others, is fully confirmed by Dr. T. Browne,[5] who considers that in it we have a drug often capable of controlling the violence of a furious maniac, and, it may be, checking the torrent of rushing ideas on which he is borne along, without putting him to sleep, and in these respects differing from morphine or chloral. It has no claim as a curative agent. Dr. Browne's trials incontestably prove the superiority of the hypodermic method. He made use of the following formula:—Hyoscyamine (Merck's crystalline) gr. iv., glycerine and distilled water, of each ʒss., carbolic acid ♏ij.: dissolve without heat. Dose ♏v.–viij. hypodermically. In Dr. Lawson's cases the drug appeared to cow the patients, reducing them to a state of abject incapacity, alike physical and mental. He always achieved this quieting effect, and usually sleep. Dr. Ringer records somewhat similar experience. In using physostigma in these cases, care must be taken, as the depression in some instances is so extreme as to excite grave anxiety.

1309. *In all irritable conditions of the Kidneys, especially in the Oxalic and Uric Acid (Gouty) Diathesis*, henbane, according to Dr. Harley, is an invaluable remedy. *In Nephritis*, both recent and chronic, it may sometimes be substituted with advantage for belladonna. *In Spasmodic Affections of the Uterus, Bladder, and*

[1] Practitioner, Feb. 1876.
[2] Lancet, Nov. 15, 1880.
[3] See West Riding Lunatic Asylum Med. Reps. vol. v.
[4] Practitioner, vol. xvii.
[5] Brit. Med. Journ. Nov. 25, 1882.

the Urethra, the antispasmodic and anodyne effects of henbane are very decided. *Enuresis of the young* is very speedily ameliorated, and ultimately cured by its judicious use. (Dr. Harley.)

1310. *In Neuralgia*, it is a powerful anodyne, but in affections of the nerves of common sensation it possesses no advantage over atropine. *In Neuralgic affections of the Internal Viscera*, it is more efficacious than belladonna. (Dr. Harley.)

1311. *In Diseases of the Eye*, henbane is a valuable means of dilating the pupil. It is less powerful than belladonna, but may be substituted for it in *Cataract, deep-seated Ulcers of the Cornea, Iritis*, &c. (See BELLADONNA.)

1312. *In the Cough and Dyspnœa of Phthisis*, great relief is often obtained by inhaling the vapour of henbane (gr. iv.–vj. of the extract in Oj. of boiling water).

1313. *In Rheumatism, painful Glandular Swellings, irritable Ulcers and Hœmorrhoids*, fomentations or cataplasms of henbane leaves afford great relief. An ointment composed of equal parts of the extract and lard or vaseline is also very serviceable in these cases.

1314. IODOFORM. Iodoformum. A product of the action of iodine on a mixture of alcohol and solution of carbonate of potassium. It was introduced into the B. Ph. in 1885.

Med. Prop. and Action. In small medicinal doses, iodoform, according to Dr. Glover, appears to possess a union of tonic, stimulant, and alterative properties, exercising at the same time a remarkable influence on the nervous system, producing occasionally a kind of intoxication, followed by convulsions and tetanic spasms. Some cases have recently been reported in which similar toxic effects followed upon the free employment of iodoform powder as a surgical dressing [*vide infra*].

According to the experience of Hill and Cooper, iodoform taken internally often proves most irritant and stimulant, causing in many persons nausea and heat at the epigastrium, even vomiting and purging. If pushed far enough, it causes iodism and other signs of poisoning. It appears rapidly in the breath, giving a peculiar and disagreeable odour both to the air expired and to that eructed or passed per anum. They state that they have tried it in a large number of cases, but have found it tolerated by few persons. The dose, they add, should seldom exceed gr. iij.–iv. three or four times daily; the commencing dose, gr. ss. in the form of pill washed down with barley water or arrowroot, or it may be given suspended in starchy fluids; thus exhibited, it is most easily borne. It should be taken on a full stomach (p. 429). As a local application its action assimilates to that of iodine, but in addition it manifests a certain amount of anæsthetic influence. Thus, as shown by M. Moretin, when introduced into the rectum in the form of suppository, so marked is its anæsthetic action, that defecation could be accomplished without consciousness on the part of the patient. Externally, it may be applied in the form of fine powder sprinkled over the sore or by means of a moistened camel's hair brush, care being taken not to let the powder touch the patient's clothes, otherwise he will carry the strong odour of the drug about with him. To remove or modify its disagreeable odour, Hill and Cooper advise the two following formulæ:—(1) *Iodo-carbon Paste:* ℞ Iodoform in fine powder 3j., Wood Charcoal 3ij., Glycerine of Starch 3ij., Glycerine 3j., Oil of Lavender, ♏xx. M. This paste is pliable and tenacious, and can be easily moulded or spread into a wafer. (2) ℞ Iodo-

form ʒjss., Oil of Eucalyptus ʒj., Olive Oil ʒv. Dissolve the iodoform in the eucalyptus oil with gentle heat, and mix with the olive oil. As a suppository grs. v. with grs. x. of cocoa butter may be employed; as an ointment the strength may vary from gr. xx.–lx. to vaseline ʒj. A combination of iodoform (gr. v.) and flexible collodion (ʒj.) is a serviceable application in many cases. Another form of application is *Iodoform Wool*, made by soaking absorbent cotton-wool in an etherial solution of iodoform, so as to contain when dry 10 per cent. of the drug. It is much used as an antiseptic dressing to wounds, and has to some extent displaced carbolic gauze. (Martindale.) It has also been used in forming medicated bougies, pastiles, &c. The great objection is, its very disagreeable odour, which, unless carefully covered over, scents the room in which the patient is in: it is partially disguised by balsam of Peru or tannin.

1315. *Therapeutic Uses. In Syphilis*, iodoform holds a foremost place amongst local agents. It is, according to Hill and Cooper (p. 481), the best application for *uncomplicated soft Chancres*. They direct it to be applied in fine powder, or in one of the forms mentioned above; the sore to be dressed two, three, or four times daily, according to the amount of the discharge, and the surface irrigated by a stream of tepid water each time the dressing is changed. Its effects are often very speedily manifested. In other *Syphilitic affections* —e.g., *Skin Diseases, Fissures of the Tongue, Ulceration of the Throat and Palate, Ulceration of the Rectum, Virulent Buboes, Periostitis, &c.*—it has been employed in large numbers of cases by different practitioners, and on the whole with satisfactory results; but, as pointed out by Mr. H. E. Clarke,[1] poisonous effects occasionally occur from its absorption into the system; hence caution is necessary in its use.

1316. *In Gonorrhœa and Gleet* (*Urethritis*) in its various stages, soluble bougies containing iodoform have been used, but in the experience of Hill and Cooper (p. 523) without benefit. Dr. Watson Cheyne,[2] who considers gonorrhœa to be of parasitic origin, speaks highly of iodoform, Eucalyptus oil and coca butter in the form of a soluble bougie as a means of cutting short the disease in its acute or inflammatory stage, but as injections of sulpho-carbolate of zinc and the internal administration of copaiba were employed conjointly, it is difficult to say how far the favourable results were due to the iodoform. *In Orchitis*, iodoform (ʒj.) with vaseline (ʒj.) is stated to have been used with good effect. (Hill and Cooper, p. 555.) The iodoform-collodion may be worth a trial in these cases. (See Collodion.)

1317. *In Pruritus Ani*, iodoform in the form of suppository is reported as useful by Dr. Purdon,[3] who likewise advocates its local use in *Fissures and Ulcers of the Rectum;* if not curative, he adds, it allows of defecation without pain, and certainly should be tried before surgical means are attempted. Dr. B. Reed[4] found the following very effectual in *Fissure of the Anus*: ℞ Iodof. Pulv. ʒj., Balsam Peruv. ʒij., Cosmolini ʒj. M.: to be applied three or four times daily after washing the parts. It is worthy of a trial in painful *Hæmorrhoidal affections*.

[1] Brit. Med. Journ. Aug. 1882, p. 81.
[2] Lancet, Aug. 5 and 12, 1882.
[3] Practitioner, June 1871.
[4] Med. Times, April 7, 1883

1318. *In some painful affections of the Bladder*, iodoform suppositories have been found serviceable in relieving pain. Dr. Morétin found them also very useful in *Chronic Enlargement of the Prostate.*

1319. *In Phthisis*, Dr. Dreschfeld[1] successfully employed iodoform by inhalation, and given internally in grain doses, with creasote and dextrine, in the form of pill. In a few cases of *Laryngeal Phthisis*, the application of iodoform powder to the ulcerated surface was followed by immediate relief, and clearing, though not healing, of the ulcers. *In Broncho-Pneumonia*, Dr. Semmola,[2] of Naples, obtained excellent results from the internal administration of iodoform, and inhalations of the same dissolved in turpentine. He found it useful also in *Bronchial Catarrh, Asthma*, &c. Under its use expectoration lessens often very rapidly, and with it the cough and dyspepsia, perhaps, he thinks, partly from the anæsthetic action of the drug.

1320. *In Scrofulous Affections of the Joints and Bones*, iodoform has been used with satisfactory results by Billroth, Mosetig-Moorhof of Vienna, Gussenbauer, and other continental practitioners. (See a *résumé* by Dr. Mikulicz in *Dublin Journal of Med. Science*, Sep. 1881, p. 286.)

1321. *In Ozœna, Nasal Catarrh, Ulceration of the Septum Nasi*, and *other Nasal Affections*, iodoform has been successfully employed by Mr. Lennox Browne,[3] Mr. A. Wilson,[4] Mr. G. Miller,[5] and others. It may be used either alone or with other powders—*e.g.* bismuth or tannin—as a snuff; or it may be blown on the parts through a quill, or applied, incorporated with vaseline (*ante*), by means of a camel's-hair brush. It has been suggested in these cases to introduce a plug of iodoform cotton into the nostril: it is worth a trial. *In Otorrhœa, and other Diseases of the Ear*, iodoform has been praised by Dr. de Rossett, Dr. Czarda, &c. Dr. R. Sinclair,[6] writing on *Chronic Suppuration of the Middle Ear*, states that scarcely anything in his experience of aural therapeutics has given him so much satisfaction as this remedy. The rapidity with which both the fœtor and the pus in old-standing cases disappear under its use, is, he says, truly astonishing. In the worst cases it is seldom necessary to make the application oftener than twice a week. He employed it in the same manner as boracic acid (*q.v.*)

1322. *Diseases of the Eye. In Purulent Ophthalmia*, Mr. Miller[7] believes iodoform to be of great service. It may be applied either in impalpable powder or in ointment (ʒss.–ʒj., Vaseline ℥j.). He found it produce less pain and irritation than any other antiseptic; it can be used in a concentrated form, and it volatilizes very slowly. *In Ophthalmia Neonatorum* he found it of little service unless employed at the very outset of the attack; he obtained far better results in *Gonorrhœal Ophthalmia*; here its use was combined with boracic acid lotion, iced compresses, &c. In several cases of *slowly-spreading infiltrated Ulcer of the Cornea*, he found that under the

[1] Brit. Med. Journ. June 29, 1882.
[2] Lancet, Aug. 26, 1882.
[3] Dublin Journ. Med. Sci. Aug. 1880.
[4] Brit. Med. Journ. Jan. 31, 1880.
[5] Edin. Med. Journ. Nov. 1882.
[6] Edin. Med. Journ. June 1881.
[7] Ophthal. Hosp. Rep. Aug. 1882.

constant application of iodoform the ulcers ceased to spread, the infiltration of their edges rapidly disappeared, and a speedy recovery ensued.

1323. *Diseases of the Skin.* In obstinate cases, especially of *Lepra*, *Psoriasis*, and *Chronic Eczema*, Dr. Glover (*op. cit.*) employed iodoform with great benefit. Subsequent experience has confirmed its value in these and other cutaneous affections, especially when attended with excessive secretion. Dr. W. Frazer[1] testifies to its value in *Impetigo*, *Eczematous Eruptions occurring in Scrofulous children*, and *Porrigo decalvans*. It has likewise been successfully used in *Impetigo larvalis*, by Dr. B. Squire,[2] in *Molluscum* (internally), by Dr. Eames;[3] in *Erythema nodosum*, by Dr. Purdon (*op. cit.*). Even in the cases in which it does not prove curative, it is valuable as a palliative in allaying pain and irritation. There is hardly any form of *Ulceration*, including *Cancerous* and *Scrofulous*, in which it has not been employed with more or less benefit. *Boils*, *Burns*, *Fissures of the Nipples*, and *Onychia* are amongst the many other affections which have been treated by it. *In Enlarged Scrofulous Glands* and other *Glandular Swellings*, it is equal, if not superior, in efficacy to iodine (*q.v.*)

1324. As a *Surgical Dressing*, iodoform has been largely used, both in continental and home clinics, as a dressing for wounds. It may be employed as iodoform cotton-wool (about 10 per cent.), or the powder or crystal may be shaken into the cavity or wiped over the exposed surface. Iodoform, although possessing a marked antiseptic power, seems yet to be less certain than corrosive sublimate. Large abscess cavities, after being emptied, may be wiped out with the powder. In these cases, and in any in which a large surface is exposed for absorption, caution is needed lest iodoform poisoning occur. Marcus Beck cites cases[4] in which he believes the very pronounced toxæmic symptoms which occurred were due to iodoform absorption. Mr. McGill, of Leeds,[5] gives some useful particulars upon this subject. He closes his remarks by saying he regards iodoform as a perfectly safe and reliable antiseptic.

1325. Iodum. Iodine.

Med. Prop. and Action. In small medicinal doses iodine produces no immediate or sensible effects on the system; but if long continued in suitable cases—*e.g.*, scrofulous affections—the general health improves, the body gains strength and plumpness, and the digestive powers sharing the general improvement, the patient is enabled further to invigorate the system by wholesome nourishment, &c. Given in too large or too long-continued doses, however, it produces a series of toxic effects which, in the aggregate, are included under the term "iodism." It may be premised, however, that these effects vary greatly in individuals, and manifest themselves much more readily in some persons than in others. They are shown most commonly on the mucous membranes, beginning with coryza, pain in the frontal sinuses, congestion of the conjunctivæ, with swelling of the eyelids, dryness and irritation of the fauces, and bronchitis. The œdematous

[1] Brit. Med. Journ. July 16, 1881.
[2] Brit. Med. Journ. May 14, 1882.
[3] Brit. Med. Journ. June 11, 1882.
[4] Brit. Med. Journ. June 1882.
[5] Lancet, May 1883.

swelling of the mucous membranes may be so great as seriously to interfere with respiration. Irritation of the alimentary canal is sometimes the chief symptoms. The tongue gets dry, and coated with white fur, though red at the tip and edges; now and then it may be tuberculated and fissured on the surface. Swelling of the tongue, stiffness of the jaws and salivation sometimes show themselves, even where no mercury has been previously taken. Dryness of the throat, loss of appetite, irritation of the stomach, vomiting, and burning pain at the epigastrium, are more often complained of; while pain in the bowels and purging are not infrequent. The nervous system is occasionally affected; its disturbance is shown by sensation of fulness in the head, singing in the ears, giddiness, spasmodic action of the muscles, and impairment of control; frequent pulse, sleeplessness, and wasting; albuminuria is also an occasional symptom, and has been observed even in some cases in which the iodine was being applied externally (Hill and Cooper, p. 425). The skin is the seat of various eruptions. These have been carefully examined by Dr. G. Thin, who divides them into three classes: (1) pustules; (2) bullæ containing serous or sero-sanguinolent fluid; and (3) purpuric spots. Of these forms more than one may be found together on the same patient. This eruption he considers to be produced, not by the action of the iodine on the sebaceous glands, as generally thought, but by its disorganizing influence on the blood-vessels at certain localized points. Each form represents different degrees of injury to the blood-vessels; thus in the pustule we have a limited œdema with congestion of the vessels; in the bulla effusion of serum with more or less of the formed elements of the blood; and in the purpuric spots the destruction of the wall of the vessel and hæmorrhage. The occurrence of this eruption indicates the propriety of at once discontinuing the remedy. *Externally* applied, it produces intense local action, and often causes a prolonged sensation of pricking and smarting. The skin, when rubbed with it, becomes of a reddish-yellow colour, from the absorption of the remedy, its presence in the cutaneous tissue, and its injection into the capillary vessels. The epidermis soon becomes detached in layers of various sizes. When applied to ulcerated surfaces, it at first causes much pain; but as the healing process progresses, the iodine causes less and less irritation. This diminution of pain is not uniformly observable. When the vapour is inhaled, it excites cough and irritation of the air-passages. Whether inhaled or applied endermically, it becomes absorbed into the system, and evidences its presence in the urine on the addition of starch. It has been deemed emmenagogue. Iodine has been proposed as a deodorizer and antiseptic by Dr. B. W. Richardson. Air charged with organic impurities is rendered entirely inodorous by the volatilization of iodine in the apartment; this may easily be effected by throwing a few fragments of iodine on a heated plate (Yeo).

Dose:—Of Iodine, gr. $\frac{1}{8}$–$\frac{1}{4}$–$\frac{1}{2}$ in pill; a bad form of administration, apt to induce gastric irritation. *Of the Tincture*, ♏v.–xx. For inhalation: *Vapor Iodi* (Tinct. of Iodine ʒj., Water ℥j.; mix in a suitable apparatus, and having applied a gentle heat, let the vapour that arises be inhaled. (See also PHTHISIS.) *Iodized Cotton*, see sect. 1356.

Remarks on its Use. 1. During the exhibition of iodine and its compounds give a light animal diet, carefully avoiding all articles containing much starchy matter, as this, by combining with the iodine, renders it comparatively inert. As a general rule, the iodides, especially those of potassium and ammonium, are preferable to iodine itself for internal administration.

2. Enjoin exercise in the open air; close, dark, ill-ventilated rooms retard the action of the remedy.

3. Give the medicine an hour or two before a meal; if taken on an empty stomach, it is liable to give rise to gastric irritation.

4. Employ an aqueous solution recently prepared, in preference to a strong alcoholic solution, which undergoes changes by long keeping.

5. If it create irritation, diminish the dose, and combine it with small doses of henbane or opium.

6. Be careful to regulate the bowels.

7. Up to a certain point, patients often visibly improve under the use of iodine; there then occurs an arrest of benefit, and the disease remains stationary, or even begins to retrograde. Under these circumstances, discontinue the medicine for a week or two, and then resume it.

8. Dr. Rodet, of Lyons, from numerous observations, concludes that iodine will rarely produce any ill effects if given only in those cases which evidently call for its employment; that it acts much more favourably if the patient has not already been subjected to other remedial measures; and that where mercury has been previously taken, iodic ptyalism is likely to occur.

9. When syringes are to be employed, they should be of glass; when baths, the vessels containing the liquid should be of wood, marble, or glass. Metal vessels of all kinds should be avoided, with the exception of platinum.

10. The recent stains of iodine may be effectually removed by a little milk, alcohol, or diluted liquor potassæ.

1326. *Therapeutic Uses. In Scrofula and Scrofulous Affections* generally, iodine and its compounds hold a foremost place in our list of remedies, though the benefit derived from them is far greater in some cases than in others. Thus in *Scrofulous Glandular Enlargements* speedy and manifest improvement follows the local use of iodine either in the form of ointment or diluted tincture (one part to three of water), or aqueous solution (*infra*), applied continuously; whilst in others little or no benefit is apparent even though conjoined with the internal administration of the iodides, cod-liver oil, and generous diet, &c., all of which are important, nay, essential adjuncts in the treatment of these cases. The more recent the enlargement, the greater, *à priori*, are the chances of success. In these cases the late Mr. Bradley,[1] of Manchester, obtained satisfactory results from the hypodermic injection into the substance of the gland of the tincture, ℥v.–x., according to the size of the tumour, at intervals of about four days. Five or six injections generally effected a cure. In the earlier stages of strumous hypertrophies, and also in the small, hard, multiple lymphomata, he found this treatment very successful; but in the later stages of strumous disease of the cervical glands, where the tumour is broken down into a mass of caseous matter, and the neighbouring skin is blue and undermined, no good results were obtained. Excision he regards as the appropriate treatment here. The plan of injecting iodine into abscesses, after the evacuation of their contents, finds favour with many; and Dr. Ringer (p. 146) states that *Iliac and Lumbar Abscesses* may be treated in this way, but the safety and efficacy of this practice, when the abscess is of any great extent, may fairly be questioned. The tincture, pure or diluted, or an aqueous solution (℞ Iodi gr. iij., Potass. Iod. gr. vj., Aq. Oj.), are advised for this purpose. *Scrofulous Ulcers* often improve under the use of the latter solution, pieces of lint moistened with it being kept on their surface, and covered with oil-silk to prevent evaporation. Weak iodine ointment is preferable in some cases, and its efficacy has been found to be increased by the addition of a small portion of

[1] Lancet, Sept. 4, 1875.

opium. *In Scrofulous Affections of the Bones and Joints, Caries,* &c., local iodine applications should not be neglected, but they fail to effect any great amount of good unless their local action is supported by constitutional treatment. In all the above cases some iodide compound (of which none is more generally useful than the iodide of iron), or cod-liver oil, should be given internally, and a good nutritious diet, with a portion of wine; out-door exercise should be enforced at the same time. *Scrofulous Coryza Ophthalmia, and Otorrhœa* are benefited by the same general treatment, aided by local iodine applications.

1327. *In Tubercular Meningitis,* especially in the advanced or chronic stage, iodine lotions to the scalp, or inunction of iodine ointment, used conjointly with the internal administration of iodide of iron and cod-liver oil, appear to offer the best chances of success, though these, in common with most other remedies, too often fail to arrest the progress of the disease. Dr. Winn relates a case of *Chronic Hydrocephalus* treated with injection of iodine (Tr. Iod. ℥xiv., Aq. ℥ij.) subsequent to paracentesis. Though the case ended fatally, it would seem to prove that iodine may be injected into the brain without causing any poisonous or other ill effect. The practice is not advocated.

1328. *Diseases of the Lungs. In Phthisis,* iodine is only administered internally in the form of the iodides of iron or potassium (*q.v.*) In some stages of the disease, especially in the second, when the expectoration is passing from the glairy into the purulent character, and also in the stage of excavation, the continuous inhalation of iodine with other antiseptics proves most useful, according to Dr. Coghill.[1] For this purpose he advises the following: —℞ T. Iodi Etherealis, Acid Carbol. āā ℥ij., Creasoti vel Thymoli ℥j., Spt. Vini Rect. ad ℥j. M. Where cough is urgent or breathing embarrassed, chloroform or sulphuric ether may be added at discretion. Of this ten drops are to be dropped on the respirator for dry inhalation, and renewed as often as necessary. It affords striking relief also in the profuse expectoration of *Purulent Bronchitis,* and in *Bronchial Asthma.* Iodine inhalation has been thought to be specially useful in *Bronchitis supervening on the Exanthemata.* A very mild iodized atmosphere, established by exposing on a heated plate or saucer a few grains of iodine in a closed apartment or bed-chamber, has seemed of great service in phthisical cases. Painting the chest with tincture of iodine every night, as a counter-irritant, relieves pain, and impregnates the air around the patient, and this atmosphere of iodine may not be without its influence for good. (Dr. C. J. B. Williams.[2])

1329. In the advanced stages of *Pleurisy,* especially with the view of promoting the absorption of pleuritic effusions, one of the most valuable means we possess is a strong solution of iodine, externally applied at the same time that the iodide of potassium is given internally; and this, according to Dr. Waters (p. 226), is the

[1] Brit. Med. Journ. May 28, 1881. [2] Lancet, Aug. 15, 1868.

best remedy we possess. Good diet, tonics, and even wine should be allowed, in order to keep up the strength. In these cases it has been proposed, after the evacuation of the effusion, to employ injections into the pleural cavity of a weak solution of iodine (gr. iv.–v., Potass. Iod. gr. iv.–v., Aq. Oj.), the strength to be increased as the patient is able to bear it. "Although," observes Dr. Ringer (p. 146), "no doubt such treatment may often be adopted with much success, still it must be used with the greatest caution, otherwise inflammation with high fever may set in and prove fatal." *In Empyema* it has been successfully employed by Mr. J. Wood.[1] In the advanced stages of *Pneumonia* the external application of iodine may be resorted to with advantage.

1330. *Diseases of the Abdominal Viscera. In Chronic Peritonitis*, especially in that arising in scrofulous subjects, iodine inunction over the abdomen, or painting the surface with the tincture, conjoined with the iodide of potassium or other iodide, internally, is often of great service.

1331. *In Chronic Affections of the Liver*, iodine and its preparations are often productive of good. *In Waxy Enlargement of the Liver*, Dr. Murchison (p. 33) speaks of them as of undoubted utility, and he considers none of them superior to the tincture in doses of ♏x.–xv. diluted, three or four times daily. *In simple Hypertrophy and Chronic Congestion*, more benefit is derived from the external application, in the form of ointment or strong tincture, than from its internal administration. It is often of great service in these cases.

1332. *In Enlargements and Chronic Affections of the Spleen*, iodine, externally and internally, may be used with advantage. One of the greatest enlargements I have met with yielded to its use. Sir R. Martin[2] observes that where there is mucous intestinal irritation, attended by a hectic form of fever, he has found benefit from the following mixture :—℞ T. Iodi, T. Ferri Perchlor. āā fʒss., Aq. ʒj. M. Ten drops to be taken in water thrice daily. According to Dr. Gimwell,[3] iodine taken internally reduces the size of the spleen more speedily than quinine. He entertains a high opinion of the antiperiodic powers of iodine, regarding it as superior to any other remedy of the Materia Medica save quinine, and that it is by far the best known substitute for that drug. Dose : ten drops of the tincture in sweetened water thrice daily for adults. A large number (135) of cases of *Intermittents* were successfully treated with it, as well as several cases of *Malarial Neuralgia* and *Diarrhœa*. It was first brought to notice by Dr. Nonodnitschauski, a Russian physician.

1333. *In the Vomiting of Pregnancy*, the tincture of iodine, in ♏x. doses, sometimes succeeds when other remedies fail. It is highly spoken of by Dr. Eulenberg,[4] who found it useful also in relieving *Cardialgia*. *In Pyrosis*, the tincture (♏iij.–v. Aq. ʒj.) is favourably spoken of by Dr. Spender.[5]

[1] Lancet, May 9, 1874.
[2] On Tropical Climates, p. 229.
[3] Canada Med. Surg. Journ. in Practitioner, Jan. 1881.
[4] Ranking's Abstract, 1861.
[5] Brit. Med. Journ. June 18, 1872.

1334. *Dropsical Affections.* Not only in renal dropsy, but in that dependent on hepatic disease, and certainly in general anasarca, independent of organic malady, the iodides of potassium or iron are useful. Frictions with iodized liniment should be combined with the internal treatment. Injections have sometimes been used, but, as pointed out by Dr. Phillips (pp. 97, 117), whose words we have been quoting, this method of treatment can only be adapted for a certain class of cases—*e.g.*, such as are dependent on chronic peritonitis, or simple anomalies of secretion, or perhaps on hepatic disorder; but not cases connected with cardiac or advanced renal disease or anæmia. Two cases successfully treated by this method are recorded by an American physician, Dr. Ford.[1]

1335. *In Fistula in Ano*, iodine injections are sometimes successful in effecting a cure without an operation, but they more often fail: this applies equally to *Fistula Lacrimalis.* A case of *Spina Bifida* successfully treated by iodine injections is recorded by Dr. Brainard.[2] The strength of the solution employed was Iodine gr. $\frac{5}{8}$, Iod. of Potassium gr. ss. to Water ℥j. Other cases successfully treated in this manner are recorded by Mr. W. Martin Coates,[3] Dr. J. R. Watt,[4] and Mr. E. M. Little.[5]

1336. *In Chronic Uterine Affections*, Dr. Tilt (p. 159) speaks well of tepid vaginal injections (T. Iod. ♏xxx.–lx., Aq. Oss.) once or twice daily; also of a daily hip bath, to which is added ℥ss. of tincture of iodine, and ℥vj. of carb. of soda. As an application to an ulcerated surface, he remarks, it cannot compete with nitrate of silver; but iodized collodion might be more useful, as it would cover the ulcer with a medicated film, and at all events iodine better suits some idiosyncrasies and pseudo-membranous ulcerations. In this class of cases, Dr. Greenhalgh[6] advocates the use of "Iodized Cotton," prepared by dissolving iodine (℥j.) and iodide of potassium (℥ij.) in glycerine (℥viij.); saturating with this solution ℥viij. of cotton-wool, and then carefully drying it. A piece about the size of a half-crown, secured by silk thread tied crosswise, is to be introduced through a speculum, and pressed firmly against the cervix uteri, over which a piece of cotton-wool, similarly secured, somewhat larger, and freely saturated with glycerine, should be placed, and retained *in situ* while the speculum is being withdrawn. It may be applied twice or thrice a week, and be kept in the upper part of the vagina from twenty-four to forty-eight hours. The cases in which he found this application most useful are, *Subinvolution of the Uterus, with or without congestion or induration of tissue, Chronic Inflammatory Enlargement and Thickening of the Cervix Uteri, Chronic Pelvic Cellulitis, Hæmatocele*, and *Pruritus* apparently due to acid secretion passing through the os uteri. In this class of cases, especially for intra-uterine medication, Dr. R. Battey[7] speaks highly of the value of "Iodized Phenol" (a mixture of 1 part of Iodine and 4 by weight of Liquid Carbolic

[1] Practitioner, vol. i. 1877.
[2] Ranking's Abstract, vol. xxxiii. p. 191, 1861.
[3] Lancet, March 3, 1866.
[4] Brit. Med. Journ. Jan. 26, 1873.
[5] Lancet, Jan. 20, 1883.
[6] Lancet, May 26, 1866.
[7] Brit. Med. Journ. March 27, 1880.

Acid) applied on "cotton cap." His estimate of its powers is very high. According to Dr. Graily Hewitt (p. 376), great benefit has been derived in many cases of *Enlarged and Inflamed Cervix Uteri* from the repeated application of the tincture of iodine. It is especially useful in patients of a sluggish habit of body or of a scrofulous diathesis.

1337. In cases of *Uterine and Ovarian Enlargement*, Dr. Tilt expresses his faith in iodine preparations: gr. j.–v. Potass. Iod. in a bitter infusion twice daily; and ʒiij.–iv. of Ung. Plumbi Iod. or Ung. Potass. Iod., rubbed in over the affected part, evaporation being prevented by oil-silk and an appropriate bandage.

1338. *In Dysmenorrhœa*, Dr. Churchill (p. 61) states that, in a case where a false membrane was habitually discharged, he effected a cure by repeated applications of the caustic tincture of iodine to the cervix uteri. *In Menorrhagia*, Dr. Matthews Duncan[1] recommends tincture of iodine in preference to perchloride of iron on account of its greater safety. When endometritis is leading to death by blood-loss, Dr. Tilt[2] recommends injections of the undiluted tincture; by their use he states that he has repeatedly checked flooding, and also uterine exfoliation in *Membranous Dysmenorrhœa*. Tincture of iodine, he adds, commends itself by antiseptic as well as hæmostatic properties, and by the fact that it has been found trustworthy by Drs. Savage, Routh, Fordyce-Barker, and Emmet.

1339. *In Chronic Ovaritis*, Mr. Lawson Tait[3] recommends counter-irritation during the inter-menstrual periods, by means of Lin. Iodi to a spot about 2½ inches in diameter in the inguinal region. It should be applied every morning as long as the patient can bear it, then discontinued for a time, and repeated as often as necessary. He states that he has had patients going on with this for months, and that it nearly always did them good.

1340. *In Ovarian Dropsy*, the question of the propriety and safety of iodine injections has been much discussed. The treatment consists in first tapping and evacuating the cyst, and then throwing into the cavity a fluid consisting of equal parts of the tincture or watery solution of iodine (to which a little iodide of potassium is added) and water. This fluid is left in for a few minutes, the cyst being slightly kneaded from without, and then allowed to escape. This operation is only adapted for cases where there is but one cyst, or possibly two large ones, and where there is no other ovarian disease. Where cysts are numerous it is wholly inapplicable, and very little benefit is to be expected from it in cases where further cyst development is in progress. Of 45 cases thus treated, recorded by Boinet,[4] 31 were cures and 14 failures and amongst the latter 9 deaths. The experience of Dr. West and Sir J. Y. Simpson is in favour of this treatment. Of 10 cases however, treated by Dr. Tyler Smith, only 2 resulted satisfactorily. (See Emmet, 813.) The drawbacks to the operation seem to be the uncertainty that it will cure, and the necessity in many cases

1 Med. Times, Aug. 7, 1880.
2 Brit. Med. Journ. March 27, 1880.
3 Brit. Med. Journ. June 6, 1874.
4 Gaz. Heb. de Méd. et Chir. Nov. 21, 1856

for repetition before a cure can be obtained. The great success which has of late years attended the operation of ovariotomy has somewhat discountenanced the practice of tapping and of injecting Iodine into the cyst.

1341. *In Enlarged Prostate*, iodine in all its forms has been tried, but according to Sir H. Thompson (p. 66) with no good result. In some cases, benefit is said to have resulted from the persistent use of weak iodine ointment, applied to the enlarged gland by means of the finger introduced into the rectum.

1342. *In Hydrocele*, the plan of treatment most successful is that introduced by Sir Ranald Martin, which consists of the injection, after paracentesis, into the tunica vaginalis of a mixture of 1 part of tincture of iodine and 2 parts of water. From f℥j. to f℥ij. of this solution is sufficient, and it may be allowed to remain in the sac. A stronger solution is preferred by some surgeons. Professor Syme used the undiluted tincture of Edinburgh, which is much stronger than that in B. Ph. In place of injection, Mr. Furneaux Jordan[1] has proposed to pass a stout needle armed with silk right through the cyst, leaving the threads hanging out; these are then wetted with iodine liniment, and drawn so as to leave the moistened portions within the cyst. Gentle friction aids the spread of the iodine to the cyst surface. If the cyst be large, freshly moistened portions may again be drawn into the cyst; but if it be small, a single thread, moistened and kept in one hour, will suffice.

1343. *Bronchocele.* In simple hypertrophy of the thyroid gland (ordinary goître), especially in its early stages, iodine and its compounds enjoy a well-merited repute: it is here that iodine, used internally and applied externally over the tumour, proves so beneficial. In other forms—*e.g.*, the fibrous and fibro-cystic varieties—its influence is far less marked, though some of them even yield to the red iodide of mercury (*q.v.*). It is in these latter cases that the hypodermic injection of iodine has proved successful in the hands of Professor Lücke, Dr. Luton, &c. For procedure, see sect. 1326. It is of first importance that the fluid be injected into the tumour: in those cases where inflammation and suppuration have followed this treatment, there is reason to fear that the fluid was injected, not into the tumour, but into the surrounding areolar tissue. The method by injection is, however, not free from danger, as sudden death from the iodine having entered a vein, and so reached the heart and caused clotting, has occurred on more than one occasion.

1344. *In Inflammation of the Joints*, the external use of iodine is strongly advocated by Dr. Davies, who considers it superior to the usual modes of treatment. He employs a tincture (gr. xl., Alcohol f℥j.); but at the commencement of treatment this should be diluted to about half its strength, or more.

1345. *In Hydrarthrosis*, iodine injections have been successfully employed by Velpeau and others. M. Bonnet advises a mixture of 1 part of iodine, 2 of iodide of potassium, and 8 of water. He

[1] Lancet, Jan. 29, 1876.

directs the quantity injected to be very nearly the same as that of the fluid drawn off. The puncture should be as small as possible, care being taken that air does not enter the joint. It is not necessary that the whole of the effused liquor should be allowed to escape. Inflammation generally ensues, but subsides in a few days. The best position for making the puncture is immediately above the patella, the leg being fully extended at the time. Applied externally in strong solution, it often materially assists in causing absorption of the effused fluid. Five cases of *Hydrarthrosis of the Knee-joint*, successfully treated by iodine injections, are related by Dr. Macdonnell,[1] of Montreal.

1346. *In Gout*, the local application of the tincture, first proposed by Dr. Davies, often affords speedy relief, more so, indeed, according to the experience of Dr. Pereira, than any other remedy. *In Acute Rheumatism*, it likewise proves very serviceable. Dr. Southey[2] considers that in the acute continued form, by painting the affected joints with a mixture of equal parts of Lin. Iodi and T. Iodi, we may procure all the benefits derivable from blisters without their disadvantages. He regards the officinal liniment as too strong, and the tincture as too weak, for use in these cases. *In Affections of the Joint, consequent on Rheumatism and Rheumatic Gout*, Dr. Fuller (p. 370) strongly recommends the following application:—℞ T. Iod. Co. ʒiij.–vj., Glycerin. ʒiijss., Aq. Dest. ʒiv. M. To this he often adds gr. iv.–vj. of corrosive sublimate. It has been found serviceable in numerous obstinate cases. He considers it far preferable to the tincture usually employed. In obstinate cases, in which the joints and tendons are stiff and thickened, he advises iodine plaster, spread upon wash-leather, to be applied closely round the affected part.

1347. *Diphtheria.* In an epidemic of diphtheria at Aylsham in 1868, Mr. Prangley[3] obtained excellent results from the local use of iodine. He applied a strong tincture (48 grains to the ounce) to every part of the throat covered with membrane at least once in 24 hours. He likewise used iodine inhalations, commencing with 10 drops of the tincture (B. Ph.) to a pint of boiling water, and repeating this as frequently as possible: the strength of the inhalation being gradually increased up to 60 drops as the patient could bear it. The general treatment throughout was supporting and stimulating. Chlorate of potash (gr. iij.–v.) and tincture of steel (♏v.–xv.) were given internally. Of 56 cases thus treated 7 died, and of the latter 5 were moribund when first seen. The value of iodine inhalations in these cases had previously been pointed out by Dr. Waring-Curran. *In Croup*, the external application to the throat has been sometimes used with alleged benefit.

1348. *Ranula.* Mr. W. Martin Coates details the cure of a large ranula by the injection of the compound tincture—♏xv. injected by means of Wood's syringe. He describes the procedure as simple, painless, and free from danger.

[1] Hunking's Abstract, xxvi. p. 201; and 193.

[2] St. Barth. Hosp. Reports, 1878, p. 22.

[3] Brit. Med. Journ. Jan. 9, 1875.

1349. *In Encysted Tumours*, the practice of injecting tincture of iodine after the evacuation of their contents is occasionally followed. If the cyst be of great extent this treatment is unadvisable, as it is apt to be followed by inflammation and much constitutional irritation, and where the cyst is very dense and fibrous it fails to effect a cure.

1350. *Chronic Skin Diseases*, especially when occurring in persons of a scrofulous diathesis, often improve under the use of iodine and its compounds, employed both locally and internally. Dr. Davies relates two cases of *Lupus* which yielded to its local application; but Mr. Milton pronounces it of doubtful value. *In Lepra, Psoriasis, Eczema, Sycosis, Pityriasis, Impetigo, &c.*, iodine in the form of ointment or tincture, locally applied, often proves a valuable adjunct to arsenic administered internally. *In Intertrigo*, in adults, the painting the surface with T. Iodi has often an excellent effect (B. Squire). *In Ringworm*, Dr. Hillier (p. 356) states that the most satisfactory treatment he has seen is the use of a mixture of iodine and oil of tar, introduced by Mr. Coster, of Hanwell Schools. A colourless solution distilled from coal-tar, sp. gr. ·853, is gradually and carefully mixed with iodine, in the proportions of 4 to 1; some heat is generated in the mixture, and a dark-coloured solution of thick treacly consistence is obtained. The more iodine that can be dissolved the better. The hair round the affected part for the distance of a quarter of an inch should be cut quite short, and the solution rubbed in firmly with a piece of sponge on the end of a stick. It is allowed to dry on the part, and left until the cuticle and black crust separate at the end of seven or ten days. In recent cases *one* application is often sufficient; in long-standing cases it may require to be repeated two or three times. It neither blisters nor causes pain, though containing so much iodine. (Hillier.) It seems well deserving of trial in any case.

1351. *In Erysipelas*, painting the surface with a tincture of iodine (gr. xl. Spt. Rect. f℥j.) was first recommended by Dr. Davies, who relates several cases successfully treated in this manner. Others have confirmed the statement of its efficacy, but if applied too strong it is apt to increase the inflammation and produce other ill effects.

1352. *In Carbuncle*, the effect of iodine locally applied (Tinct. Iod. f℥j., Aq. ℥iij.), according to Dr. Balman,[1] is sometimes most striking, the pain and irritation being almost immediately relieved, and the separation of the slough accelerated. One of the most successful modes of treating *Ganglions* is by injections of tinct. of iodine (1 part) and water (2 parts).

1353. *Indolent Buboes* may be painted with a solution of iodine (grs. xx.) in glycerine (℥j.): where a stronger counter-irritant is required, substitute a solution of iodine, ℥j. in spirit (℥j.), which will cause vesication. The bubo often disappears rapidly after a few repetitions of this application (Hill and Cooper, p. 489).

[1] Lancet, April 13, 1867.

Syphilitic Periostitis, Nodes, &c., often improve under the external application of iodine.

1354. *In Pruritus Pudendi,* the local application of the tincture occasionally affords great relief. In a case of *Pruritus Scroti,* which resisted every other treatment for ten days, I witnessed almost immediate benefit from the application of the tincture. *In Pruritus Senilis,* it is also productive of excellent effects, according to the experience of Sir E. Wilson (p. 271).

1355. *In Onychid;* the local application of the tincture will often subdue the disease. It should be applied twice or thrice daily, in the form of a strong alcoholic solution (gr. xl. ad Spt. Vin. Rect. ℥j.).

1356. *To Corns,* a strong tincture (gr. xl. ad Alcohol f℥j.) has proved successful. *To Chilblains* it is also stated to be an excellent application.

1357. *In Opacities and Ulceration of the Cornea, and in Granular Lids,* attended with *Photophobia,* the application of iodine paint over the brow and behind the ear is often of great service. Iodine or its compounds should at the same time be given internally.

1358. *In Retraction of the Gums, with consequent loosening of the Teeth (Pyorrhœa Alveolaris),* Professor Stillé recommends the application, with a camel's-hair brush, after each meal, of an aqueous solution of iodine (gr. j. Aq. ℥j.), the mouth being immediately afterwards washed. (Wood.)

1359. *In ununited Fractures,* frictions with iodine are occasionally useful. Of eleven cases mentioned by Mr. Norris,[1] five were cured by iodine. It may also be given internally.

1360. Ipecacuanha. Ipecacuanhæ Radix.

Med. Prop. and Action. These are somewhat complex and anomalous. Powdered ipecacuanha, in doses of 20 to 30 grains, given plentifully diluted and followed by draughts of warm fluid, produces speedy emesis; the same doses taken with as little fluid as possible, and all drinks (beyond a teaspoonful of cold water to quench great thirst) being withheld, no effect beyond more or less nausea follows (see sect. 1365), and in minute or fractional doses it exercises a marked power in arresting vomiting in several morbid states (see sect. 1368). In smaller doses of grs. ij.-iv. it is expectorant and diaphoretic. From Rutherford's experiments on dogs it appears to act as a powerful hepatic stimulant, and to increase the secretion of intestinal mucus. It would appear likewise to possess febrifuge or anti-periodic properties, from the facts adduced by Dr. Woodhall in his valuable memoir "On the Non-Emetic Use of Ipecacuanha" (Philad. 1876). Valuable oxytocic powers have also been assigned to it. According to Mr. Higginbottom,[2] the main efficacy of ipecacuanha consists in the power which he considers it to possess of stimulating and restoring the normal action of the capillary system; and with this view, he states that for fifty years he has been constantly in the habit of prescribing it in *English Cholera, Uterine Hæmorrhage, Syncope, Diseases of Old Age, &c.* As an emetic, it is mild, safe, and certain; it does not operate so rapidly as some other emetics, and does not leave that amount of depression and weakness which follows the use of tartar emetic. It is considered to hold a mid place between this latter and sulphate of zinc. According to Dr. Ringer (p. 434), its action as an emetic is rendered more sure if it be given in divided doses at short intervals, as

[1] See Med. Gaz. Nov. 15, 1850.

[2] Brit. Med. Journ. Aug. 22, 1868.

5 grains in a little warm water every 5 or 10 minutes. Its active principle *Emetine* is emetic in doses of gr. $\frac{1}{6}$–$\frac{1}{3}$, but as far as is known it possesses no advantages over the root. It is to be preferred when the powers of the stomach require to be maintained, and when vomiting is requisite in delicate subjects, and in children; for the latter, the Vinum Ipecacuanhæ, in doses of ♏xx.–f℥j., till it cause vomiting, is the best formula. Some persons, from idiosyncrasy, are unable to take ipecacuanha; in such, even the smell of the powdered root produces a distressing sense of suffocation. The powder should be kept in closely stoppered bottles, and exposed to the light. Boiling renders it inert; it should not, therefore, be given in decoction. Infusion of nut-galls is the best antidote for an over-dose. Externally applied, it acts as an irritant, causing vesicular and pustular eruption, sometimes followed by troublesome ulceration. Dr. Graves states that the infusion of ipecacuanha in the form of enema is a remedy of very considerable value, not sufficiently appreciated by most practitioners. When applied locally in the form of poultice or paste to *Venomous Bites or Stings*, it often allays the pain and irritation.

Dose:—In powder, gr. ss.–ij. as expectorant; gr. xv.–xxx. as emetic. *Of the compound powder*, gr. v.–xv.; *of the wine*, ♏v.–xl. as expectorant; ℥iij.–vj. as an emetic.

1361. *Therapeutic Uses. Diseases of the Lungs. In Spasmodic Asthma*, ipecacuanha, in a full emetic dose (not less than grs. xx.), so as to produce speedy emesis, is often effectual in arresting a paroxysm, but to be so, it should be given at the outset, or as early as possible in the attack. It may, in proportionate doses, be given to children with safety and advantage. Dr. Hyde Salter considers that it acts by depressing nervous irritability and enfeebling the contraction of the bronchial muscle. Dr. C. D. Phillips[1] speaks highly of its value in small doses, ♏v. of Vin. Ipecac., repeated every ten to thirty minutes for two or three hours, unless relief comes much sooner, in which case the dose may be diminished and taken less frequently. Thus given, he states that in many cases of nocturnal spasmodic asthma, in which hours are spent in great distress, with livid face and lips, loud wheezing through the chest and want of breath, causing fear of suffocation, if there be no organic disease of the heart or of the lungs, ipecacuanha will give quick and marked relief.

1362. *In Bronchial Asthma and Winter Cough*, Dr. Ringer extols the efficacy of ipecacuanha wine, applied in the form of spray to the larynx, and it certainly seems well worthy of an extended trial. For the class of cases for which its treatment is adapted, the mode of application, &c., we must refer to Dr. Ringer's valuable work (pp. 427-432), as his remarks and directions are too extensive to be given in detail, and would be spoilt by abridgment. *In Hooping-cough*, in the early stages, ipecacuanha often proves very beneficial. Mr. Pearson's formula is a popular and useful one:— ℞ Vin. Ipecac. ♏v., T. Opii ♏j., Sodæ Carb. gr. ij., Aq. q.s. In cases occurring in young children the opium may be omitted. Dr. Phillips employed it in 23 cases in much smaller doses with the best effect, especially when vomiting in the paroxysms forms a prominent feature in the disease. Of a mixture containing ♏xxx. of ipecacuanha wine in ℥iv. of water, he directs a dessert-spoonful to be given every 1, 2, or 3 hours, according to the severity of

[1] Practitioner, Nov. 1869.

the cough. Children under five years old should only take a teaspoonful of this mixture, but many children of this age can tolerate and are benefited by much larger doses. He found it act well also in the *Capillary Bronchitis of Children*, even when complicated with croupy symptoms.

1363. *In Croup* and in *Diphtheria*, ipecacuanha has been used as an emetic when this class of remedies has been called for, but as a general rule it is inferior to the sulphate of copper or of zinc.

1364. *In the Coughs of Childhood*, ipecacuanha is one of the most generally useful expectorants we can use. The following formulæ of Dr. Hillier's are good examples:—℞ Sodæ Bicarb. gr. xvj., Sp. Æther. Nit. ʒj., T. Opii ♏viij., Vin., Ipecac. ♏xxxij., Syrup ʒij., Aq. Anethi ad ℥ij. M. Dose, two teaspoonfuls for a child two years old. Or ℞ Vin. Ipecac. gr. xxiv., Potass. Citrat. gr. xl., Syrup. Tolu ʒij., Decoct. Hordei ad ℥ij. M. Dose, one or two teaspoonfuls.

1365. *Diseases of the Abdominal Viscera. In Dysentery*, we have in ipecacuanha a remedy of the highest value, justly entitling it to its old designation, "Radix anti-dysenterica." From its first introduction by Piso in 1658 to the present time, it has enjoyed more or less repute in this disease, and has formed an ingredient in most of the formulæ employed by our highest tropical authorities; but its real powers were often obscured and almost lost sight of by the practice of conjoining it with other remedies which were supposed to possess similar remedial powers. Of this we have an example in Annesley's formula, which I am bound by experience to say is very serviceable, and which for many years was very generally employed in Southern India:—℞ Pil. Hydrarg. gr. ij.–iij., Pulv. Ipecac. Rad. gr. j.–ij., Opii gr. ¼. M. Ft. a pill to be taken every four hours. Mr. Twining, it is true, trusted to ipecacuanha alone, giving it in eight-grain doses with extract of gentian twice or thrice daily, and others followed his example; but it was not till 1858 that its full powers were demonstrated by Mr. Docker, who reintroduced the plan, originally practised by Piso and Helvetius, of prescribing it alone in large and effective doses; and the result has been not only comparatively speedy cures, but a marked diminution in the rate of mortality in this disease. The treatment in the main, now almost universally practised, is to administer as early in the disease as possible grs. xxv.–xxx. of ipecacuanha, in as small a quantity of fluid as possible, premising half an hour previously ♏xxx. of laudanum or a few drops of chloroform (on this point there are differences of opinion). The patient should keep perfectly still in bed, and abstain from fluid for at least three hours. If thirsty, he may suck a little ice, or may have a teaspoonful of cold water. It is seldom, under this management, that nausea is excessive, and vomiting is rarely troublesome, seldom setting in for two hours after the medicine has been taken. Sinapisms or turpentine epithems should be applied to the abdomen. In from eight to ten hours, according to the urgency of the symptoms and the effect produced by the first dose, ipecacuanha in a reduced dose

should be repeated, with the same precautions as before. The effects of this treatment are soon manifest and surprising; the tormina and tenesmus subside, the motions quickly become feculent, blood and slime disappear, and often, after profuse action of the skin, the patient falls into a tranquil sleep and awakes refreshed. The treatment may require to be continued for some days, the medicine being given in diminished doses, care being taken to allow a sufficient interval to admit of the patient taking some mild nourishment suited to the stage of the disease. As the disease abates, the dose should be reduced. It is well, however, to administer grs. x.–xij. at bedtime for a night or two, after the stools are to all appearance healthy. Fomentations, turpentine epithems, or chloroform liniment to the abdomen, lessen tormina and diminish suffering. If a little diarrhœa without the dysenteric odour remain, it may be checked with a little astringent mixture—*e.g.* Pulv. Cretæ Co., with or without opium. Astringents in any shape during the acute stage are not only useless, but dangerous. (Dr. Maclean.) To sum up, it appears—1. That acute dysentery is more successfully and speedily treated by large doses of ipecacuanha than by other means. 2. That it is more effectual in the acute than in the chronic forms. 3. That large doses, such as are mentioned above, may be given with perfect safety, without fear of hyperemesis or other ill effects; and 4. That it is less successful with the natives of India than with Europeans.

1366. *In Diarrhœa*, ipecacuanha proves serviceable, often effecting a cure when other medicines have proved ineffectual. *In the Diarrhœa of Infants, arising either from improper or unwholesome food, or from dentition*, Dr. Pavy employs with most satisfactory results a combination of Vin. Ipecac., T. Calumbæ, and solution of citrate of potash. Conjoined with this he prescribes grey powder (gr. ij.) every morning, or sometimes a powder containing calomel (gr. $\frac{1}{4}$–$\frac{1}{2}$), dried carbonate of soda (gr. ij.), and aromatic chalk powder (gr. v.). *In Infantile Diarrhœa attendant on Teething*, Dr. West advises the following:—℞ Mist. Acaciæ ʒvj., Liq. Potass. ♏xxx., Vin. Ipecac. ♏xxiv., Syr. Althææ ʒiv., Aq. ʒxiij. M. Dose, ʒiij. every six hours for a child æt. twelve to eighteen months. *In the Diarrhœa and Dysenteric Diarrhœa of Children*, Dr. Phillips states that gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$ of ipecacuanha, with a little white sugar, at intervals of one to three hours, is generally sufficient, but the quantity must be increased if necessary. *In English Cholera*, Mr. Higginbottom states that he has for years prescribed it with advantage.

1367. *In Atonic Dyspepsia*, especially when the biliary secretion is deficient or vitiated, ipecacuanha, in doses of gr. ss.–j., in the form of pill, with gr. iij.–iv. of rhubarb, taken before meals, often proves serviceable. Its mode of operation is obscure, but under its use the urgency of the symptoms subsides, the tone of the digestive organs improves, and the evacuations assume a healthy character. *In Functional Derangement of the Liver*, ipecacuanha, in small and long-continued doses, may be employed with advantage.

1368. *Vomiting.* There are few remedies, Dr. Ringer observes, so powerful in checking some forms of vomiting as ipecacuanha. In drop doses of the wine, administered every hour, or three times a day, according to the urgency of the case, he states that in abundant instances he has seen it check *Vomiting of Pregnancy, the Morning Vomiting of Drunkards, the Morning Vomiting which sometimes accompanies general weakness after acute diseases,* and *that of Acute Catarrh of the Stomach in children.* That form of vomiting after meals in which there is no nausea, pain, or even discomfort, the food being merely rejected partially, and often very little digested, is frequently, according to Dr. Ringer, quickly stayed by these small doses of ipecacuanha. Even *in Vomiting from Cancer of the Stomach,* it has sometimes succeeded when ordinary remedies have entirely failed. According to Dr. Phillips, its beneficial operation is clearly discernible in most cases of continued and obstinate retching or vomiting, where the stomach is not primarily affected, but disturbed by sympathy with some other organ or part of the body, whether the primary affection be acute or chronic. Further evidence of its efficiency in the *Vomiting of Pregnancy* is adduced by Mr. C. Fuller. Under the use of single drops of the wine in a teaspoonful of water every hour, he found it arrest obstinate vomiting in the course of two days. He also testifies to its value in those small doses in the *Vomiting and Diarrhœa of children.* In his hands it failed to arrest the vomiting of drunkards.

1369. *Other Diseases. In Hœmoptysis, Hœmaturia, Hœmatemesis, Epistaxis, and in internal Hœmorrhages generally,* ipecacuanha appears to exercise a powerful influence. Dr. Osborne considers that the production of vomiting is necessary to develop its influence; but Mr. Trenor[1] has published numerous interesting cases, in which it was given in such doses as to produce nausea without actual vomiting; and this procedure was attended with marked benefit, arresting the hæmorrhage, and restoring heat and life to patients who were in a state of collapse from excessive loss of blood. The doses given by Mr. Trenor varied from gr. j.–ij. every fifteen or thirty minutes, until nausea was felt; when the benefit was generally evident the medicine was discontinued. The value of ipecacuanha in this class of diseases is not sufficiently attended to; at the same time it is better to avoid vomiting, particularly in hæmorrhage from the lungs and stomach, although Dr. Osborne observes that he never saw it produce any ill effect. Prof. Graves (ii. p. 141) also bears testimony to the efficacy of this treatment. Dr. Phillips states that the *Hœmorrhage in the early stages of Phthisis* may often be readily arrested by its means.

1370. *In Uterine Hœmorrhage and Menorrhagia,* ipecacuanha, given in full emetic doses, has often been followed by the best effects. Dr. Osborne,[2] a strong advocate for its use in these cases, advises gr. xx. of the powdered root in the evening, followed by an

[1] Dublin Journ. vol. xviii. p. 481. [2] Trans. of Irish Coll. Physicians, vol. v. p. 18.

acidulated draught in the morning. The discharge usually ceased in twenty-four hours; and if a relapse occurred, a repetition of the emetic never failed to render the cure permanent. Mr. Higginbottom reports a case of post-partum hæmorrhage checked by ipecacuanha after ergot had failed: other similar cases are on record. Dr. Tyler Smith thus explains its action in these cases. "Ipecacuanha," he says, "by its emetic action, excites contraction of the abdominal muscles and compression of the uterus, which may in turn re-excite some amount of uterine reflex action; but beyond this it appears to have a special action upon the uterus, increasing its contractile power beyond what could be imagined to occur from the merely secondary effects of vomiting." This view is held by Dr. J. H. Carriger, of Tennessee,[1] who maintains that in ipecacuanha we have an oxytocic, potent and safer than ergot for both mother and child, because it stimulates the uterus into a more normal action, and at the same time facilitates dilatation of the rigid uterus. Dr. Carriger cites several cases of *Labour* in which the administration of two or three grains of the drug was followed by relaxation and dilatation of the os, increased uterine contraction, bearing-down pains, and the safe and speedy termination of the labour.

1371. *In Cholera*, an ipecacuanha emetic, at the outset of an attack, forms part of the eliminative treatment advocated by some; but unless there is reason to suppose that some crude or undigested food in the stomach is the cause of the attack, the practice does not appear advisable; but in such a case, an emetic, by removing the cause, may be of use. A far more promising practice is to administer it in very small often-repeated doses in the manner employed in hæmorrhages by Mr. Trenor (sect. 1369). In the latter affections, even when a state of collapse supervened, the vital powers recovered themselves in a striking manner under the use of ipecacuanha; and the same remedy seems to merit a trial in cholera, even in the stage of collapse; the many points of similarity between cholera and profuse hæmorrhage would alone suggest its probable utility. The more recently ascertained facts with regard to the power of minute doses to arrest vomiting (sect. 1368) are strongly in favour of its probable efficiency. On the other hand, Dr. Woodhall (p. 140) advocates a treatment similar to that described above for dysentery (*q.v.*), namely, by giving a drachm dose of the powder in a very small quantity of fluid, to be repeated as to quantity and interval as occasion requires.

1372. *Intermittent Fever.* Dr. Woodhall (p. 59) advances facts from his own experience and that of others to show that ipecacuanha possesses febrifuge or antiperiodic powers. He states that he is within bounds when he says that he has used it in at least fifty cases, and that in no instance of ordinary uncomplicated ague did it fail. He prescribed it in varying doses up to gr. xx., but in ordinary agues he found gr. j.–ij., every three to six hours, suffice (p. 67).

[1] Med. Press, May 21, 1879.

1373. Pulvis Ipecacuanhæ Compositus. Compound Powder of Ipecacuanha. Dover's Powder.

Med. Prop. and Action. Diaphoretic, in doses of gr. v.–xv. It is also narcotic, although the ipecacuanha appears greatly to modify the action of the opium, at the same time that the nauseating action of the ipecacuanha is controlled by the opium. It is a very valuable formula, but its operation is far from uniform; in some giving rise to emesis, and very frequently, amongst the Hindoos, to a purgative operation. Diluents, although they promote the diaphoretic action, should be avoided immediately after taking the powder, as under such circumstances it is very apt to be rejected by vomiting.

Dose, gr. v.–xv. or more. Gr. x. contain gr. j. of opium.

1374. *Therapeutic Uses. In Chronic Dysentery*, Dover's powder is often of the greatest service, either in a full dose (gr. x.–xij.) at bedtime, or in small, frequently-repeated doses, in combination with nitrate of silver. It was formerly much in repute in acute dysentery, but it is inferior in efficacy to ipecacuanha alone (*q.v.*). In some forms of passive *Diarrhœa, as that of Fever and of Childhood*, it proves very serviceable either alone or conjoined with Hyd. c. Cretæ, &c., as indicated.

1375. *In Glandular Disease of the Kidney* it is of the first importance to maintain a free cutaneous discharge, and for this purpose Dover's powder has been found highly serviceable in doses of gr. v.–viij., thrice daily. It not only acts as a diaphoretic, but allays the pain and irritability. The warm bath every other evening, or oftener, greatly assists its operation. (Christison.)

1376. *In profuse Perspirations*, particularly in those which attend hectic fever, you can put a stop to them, remarks Dr. Graves (i. p. 488) by giving a few grains of Dover's powder at bedtime. It is hard to account for this, he observes, but it is a fact.

1376*a*. *In Chronic Rheumatism, and in some Neuralgic Affections*, opiates and sedatives prove eminently serviceable. In these cases, Dover's powder, in doses of gr. x.–xij. at bedtime, affords a great amount of comfort and relief.

1376*b*. *Coryza and Catarrhal Affections* may often be arrested by a full dose of Dover's powder (gr. x.) taken at bedtime at the very outset of the attack. It is very beneficial in *Tonsillitis* when attended by much fever and vascular excitement. (Morell Mackenzie, p. 58.)

1377. Iridin. A pulverulent extract from Iris versicolor, *Linn.* Blue Flag.

Med. Prop. and Action. Cathartic and cholagogue. Dr. Rutherford instituted some comparative trials with this article and Euonymin which are interesting. Given to dogs, they both powerfully stimulate the liver, while they do not powerfully stimulate the intestine. Although not so powerful as podophyllin, they will doubtless be preferred in many cases to that substance, on account of their milder action on the intestine. Observations on man show that the average dose of iridin is four grains; of euonymin two grains. In either case, grs. ij. Ext. Hyoscyam. should be conjoined with them

[1] Practitioner, May 1879.

and given at bedtime, otherwise they are apt to cause griping; neither produces headache or sickness. In some persons the above doses of both substances produces a sufficient purgative effect; in others they are not so, and then griping is apt to ensue. A mild saline aperient, such as Püllna or Carlsbad water, on the following morning, is advisable, so that the bile secreted during the night may be fully and quickly removed. Euonymin seems preferable when repeated stimulation of the liver is desirable. Although euonymin usually suffices so quickly to remove a slight feeling of biliousness, iridin is the more powerful of the two when the tongue is decidedly yellow. Dr. Rutherford adds that in such a case he has been more than once surprised to find, on awaking in the morning, after a four-grain dose of iridin at night-time, to find the yellow tongue and bilious sensations entirely gone. He cites Mr. Hardyman, of Cardiff, who, in over fifty cases of *Biliary Derangement* and *Sick Headache*, found euonymin of great value. In place of a single dose, he found it more effectual to give two grains at bedtime on two successive nights, following it each morning with a saline purge. The same probably holds good with iridin.

1378. *Therapeutic Uses.* Resemble those of Euonymin (*q.v.*).

In the Treatment of Gallstones, &c., Dr. Young,[1] of Edinburgh, reports cases which were benefited by iridin; and inactivity of the liver in general is well treated by iridin, or by it combined with euonymin. *In Malarial Jaundice*, iridin has some reputation.

1379. *In the Vomiting of Pregnancy*, iridin, by clearing the alimentary tract and promoting the action of the liver, proves useful. It has been recommended in gr. ij. doses.

1380. JABORANDI. The dried leaflets of Pilocarpus pennatifolius, *Lemaire*. Introduced into the B.P. 1855. The preparations made officinal are an extract, an infusion, and a tincture, with the Nitrate of the alkaloid Pilocarpine.

Dose:—Of the Powder, gr. v.–ʒj. *Of the Extract*, gr. ij.–x.; *of the Infusion*, ʒj.–ij. *Of the Tincture*, ♏xxx.–lx.

For *Med. Prop.* and *Therapeutic Uses*, see PILOCARPINE.

1381. JALAPA. Jalap.

Med. Prop. and Action. Cathartic. It is a safe and efficacious purgative, operating with rapidity and certainty, causing little irritation, producing copious watery stools, and leaving but slight subsequent constipation. Its activity depends upon the resin, which is an efficient purge, and forms an eligible mode for internal exhibition. The *modus operandi* of jalap is not certain. According to Buchheim, it acts solely by combining with the bile. He assumes that its activity is determinable by the soda of the bile. The experimental researches of Dr. Rutherford go to prove that jalap is a powerful cholagogue purgative. In some persons, jalap causes vomiting, nausea, &c.; and when the medicine passes into the intestines, griping is often experienced. Its efficacy as a hydragogue is greatly increased by the addition of the acid tartrate of potash. The Pulv. Jalapæ Co. is an excellent hydragogue purgative. Camphor is said to lessen the griping, while it augments its purgative operation.

Dose:—Of Powdered Jalap, gr. x.–xxx. for an adult, gr. ij.–v. for children. *Of the Extract*, gr. v.–xv. *Of the Resin*, gr. ij.–v. *Of Compound Jalap Powder*, gr. xx.–lx. *Of the Tincture*, f3ss.–ij.

[1] Brit. Med. Journ. Oct. 1881.

1382. *Therapeutic Uses. In Dropsical Effusions attendant on Bright's Disease*, Dr. W. Roberts (v. p. 525) considers that for general use no hydragogue is superior to Pulv. Jalapæ Co., as it acts quickly, and produces two or three copious watery stools. The nausea it is apt to occasion may be mitigated by giving an active dose—*e.g.*, Pulv. Jalapæ gr. xv.–xx., with ʒiij. of the bitartrate of potash and a little ginger, early in the morning twice or thrice a week. The same remarks hold good equally in *Dropsy arising from Cardiac, Hepatic, or other diseases.*

1383. *In Constipation* depending upon atony of the intestines, jalap, in combination with a carminative or calomel, may be given with advantage. *In the Constipation of gouty subjects*, on the eve of an attack, Dr. Burne[1] advises the following formula :—℞ Pulv. Jalapæ ʒss., Vin. Colchici, T. Hyoscyami, Spt. Lavand. Co. āā fʒss., Aq. Dest. ʒj.

1384. *Against Worms, particularly Lumbrici*, jalap, in combination with calomel, is a safe and efficient vermifuge. It is particularly adapted for children.

1385. JUNIPERUS COMMUNIS. Common Juniper.

Med. Prop. and Action. The fruit is a stimulant diuretic. *Active principle*, a volatile oil, which is one of the most powerful diuretics in the Materia Medica. From Dr. Nunneley's[2] experiments, it appears that the oil of juniper slightly reduces the amount of water excreted, and appreciably increases both the urea and solids. If long continued, juniper communicates a violet-like odour to the urine, and produces great irritation of the urinary organs, strangury, bloody urine, &c. It was formerly deemed emmenagogue. It is extensively used in flavouring hollands.

1386. *Therapeutic Uses. In Dropsical Affections, especially in that following Scarlatina*, juniper is an old-established remedy, and the spirit forms an excellent adjunct to other diuretics, such as cream of tartar, acetate of potash, &c. Its use is mainly confined to asthenic cases.

1387. *In Dysmenorrhœa*, the popular remedy, gin (a hot glass of gin and water) probably owes much of its efficacy to the juniper contained in it. As a substitute for this, Dr. B. W. Richardson[3] advises the following :—℞ Croton Chloral gr. ij., Ol. Junip. ♏iij., Glycerin. ʒj., Aq. Dest. ʒjss. for a dose. To be taken when the pain is great, and repeated every five or six hours till relief is obtained.

1388. *In Chronic Laryngitis*, Dr. Morell Mackenzie speaks of the following as a useful steam inhalation :—℞ Ol. Juniperi Angl. ♏xx., Magnes. Carb. Co. gr. x., Aq. ʒiij. A teaspoonful for each inhalation as directed in Pinus Sylvestris (*q.v.*).

1389. KAIRIN, or KAIRINE.

Med. Prop. and Action. An artificial alkaloid, prepared from Chinolin, occurs in the form of a yellowish-white crystalline, odourless powder, with an acid, disagreeable, bitter taste. It is soluble in water, but on account of its

[1] On Habitual Constipation, p. 212.
[2] Med. Chir. Trans. liii. (1870) p. 36.
[3] Med. Press, Jan. 19, 1881.

taste it is best given in gelatine capsules. It is a powerful antipyretic, inducing a marked reduction of the temperature, the reduction taking place without collapse or any other disagreeable after-effects. Under its use the urine has often a blackish-green colour. It has been given with more or less beneficial effects in various *Febrile and Inflammatory Affections*, as *Typhoid Fever*, *Scarlatina*, *Measles*, *Acute Rheumatism*, *Phthisis*, *Pneumonia*, *Pleurisy*, *Erysipelas*, and *Septicæmia*. It is advised to commence with eight-grain doses per hour on the first day, and to give these, say four times successively, but to cease as soon as the temperature has attained 100° F. The temperature of the body should be observed every one or two hours during the first day, and as soon as it is reduced to 100° F., only four grains should be given per hour until the temperature is again perceptibly rising, when the former dose of eight grains should again be administered. The occurrence of a sensation of chilliness is a true indication for again resorting to the remedy in even larger doses. The action of Kairine is, however, very transitory, and unless the dose is frequently repeated, the temperature soon rises again. Although much thought of by some in the earlier days of its introduction, more extended trial does not quite realize early anticipations. Von Ziemssen points out that several cases of collapse have occurred under its employment.

1390. *Therapeutic Uses. In Pyretic and Febrile States*, Kairin may be employed in doses of from 5 to 10 grains hourly until the temperature drops (see above). It may give rise to pain in the nose and over the frontal sinuses; or to gastric disturbance and vomiting;[1] and hence the patient will need careful watching.

1391. Kamala. A granular red powder from the surface of the fruit of Mallotus Philippinensis (*Müll.*).

Med. Prop. and Action. Anthelmintic, chiefly in cases of *Tænia* or *Tape-worm*. The first notice of its use in this character, it having previously been employed largely as a dye, occurs in Royle's "Illustrations of Himalayan Botany," published in 1839; but it attracted little notice till 1853, when Dr. C. Mackinnon recorded several cases of tænia successfully treated by its use. These results were fully confirmed by Dr. T. Anderson, who furnishes a good account of its physiological action; he found that on an adult, the powder in a dose of ʒij.–iv., in addition to purging, frequently caused nausea and vomiting, and in some cases griping. Its action on the bowels, however, was found to be very variable. A strong ethereal or alcoholic tincture, besides acting more mildly, was found to be followed by more uniform effects; and a dose of the tincture sufficient to produce the full anthelmintic effects of the drug was found never to be followed by more than six stools unattended with griping, or with any observable effects on the pulse or nervous system. The only objection to it is, that when the powder is used, considerable nausea occasionally follows, although this does not appear to be more than that produced by pomegranate and other althelmintics. Dr. Anderson also observed that, after ʒiij. of the powder had been administered, the worm was usually expelled in the third or fourth stool, generally entire, and almost always dead. Its action appears to be principally confined to tænia. In cases of lumbrici it seems to exercise very little effect beyond that of an ordinary purgative. Recently it has been proposed to inject tincture of kamala hypodermically into hydatid cysts.[2] The dose of the powder is gr. xxx.–ʒij. for an adult, and it is unnecessary to give any other medicine before or after. Of the Alcoholic Tincture (ʒvj., Sp. Rect. Oj.) the dose is fʒss., either in one or two doses, with some aromatic water. The natives of India employ an ointment of kamala externally in itch and other skin diseases (Mackinnon); and Dr. W. Moore states that in *Herpes circinatus* he found kamala applied on moistened lint an effectual cure. He considers that it may prove useful in other allied eruptions.

1 Von Ziemssen, Handbk. Therap. p. 491. 2 Ibid. p. 471.

1392. Kino. Kino.

Med. Prop. and Action. Astringent in doses of gr. x.–xxx. It contains the same principles as catechu, viz., a species of tannin (kino-tannic acid) and catechin. It is best given in tincture (ʒss.–ij.) or in the form of Pulv. Kino Co. (gr. v.–xx.). Externally, it is occasionally applied as an astringent to copiously discharging *ulcers*, and to relaxed mucous surfaces.

1393. *Therapeutic Uses.* The form of *Diarrhœa* which appears to be the most benefited by kino is that connected with follicular derangement. *In incipient stages of Follicular Dyspepsia*, Dr. Pemberton[1] placed his chief reliance upon kino in combination with opium (Kino gr. x., Opium gr. $\frac{1}{4}$–$\frac{1}{2}$, and taken every four hours). He preferred kino, as it did not appear to constipate the bowels, unless diarrhœa was present. *In Pyrosis*, kino is often very serviceable. Sir T. Watson speaks of Pulv. Kino Co. (gr. x. thrice a day) as an admirable remedy in this affection; and Dr. Wilson Fox also regards it as the best remedy which can be employed.

1394. *In the Profuse Perspirations of Phthisis*, Sir T. Watson (ii. p. 215) advises the exhibition of Pulv. Kino Co. "It certainly has," he observes, "much power over the perspirations, and it has this further advantage, that (containing opium) it tends to control the diarrhœa and to check the cough."

1395. *In Relaxation of the Uvula*, kino is an excellent application, either dissolved and used as a gargle, or allowed to dissolve slowly in the mouth.

Kousso. See Cusso.

1396. Koumiss, Kumyss.

Med. Prop. and Action. A pure animal milk in a state of fermentation. In its composition it combines all the requirements for a wholesome nutrition of the body, while certain products of the fermentation add to it important therapeutic properties. All animal milks are convertible into Koumiss, and the general qualitative composition of the products is the same for all. In all, the act of fermentation sets free the casein, albumen, and butter in a highly attenuated form, and develops alcohol and carbonic and lactic acids, together, according to Morfit, with certain fragrant volatile compounds. Once started, the fermentation continues until all the lactose of the milk has been transformed. The cases in which it has been found serviceable as a therapeutic agent include *Constipation*, *Impaired Digestion*, *Chronic Bronchitis*, *Consumption*, *Diarrhœa*, *Diabetes*, the *Adynamic stage of Febrile Diseases*, *Debility after Confinements*, *Operations*, &c. (Dr. Jagielski.)[2]

1397. *Therapeutic Uses. In Phthisis*, Dr. Stange,[3] of St. Petersburg, quotes Russian authorities in contention that the koumiss cure has proved successful in restoring phthisis patients to health. It seems at present doubtful whether the koumiss cure is equally successful when carried on away from the Steppes; but Karrill affirms this is so, and states that not only are the patients temporarily relieved, but are actually restored to their pristine health. The koumiss cure may thus be briefly described.[4] The patients lead a

[1] Dis. of Abdom. Viscera, p. 149.
[2] Lancet, Aug. 19, 1871.
[3] "On the Koumiss Cure," Von Ziemssen's Handbk. Therap. 1885.
[4] Spassky, quoted by Von Ziemssen, p. 349.

quiet country life, avoiding all excitement, and are instructed to drink a glass of koumiss every half-hour. This is omitted for two hours before the midday and evening meals. The diet is to be composed of meat and fatty foods, while sweets, fruits, and salads are interdicted, together with tea, coffee, and spirits. If diarrhœa occurs, the addition of lime-water to the koumiss will serve to check it. Artificially prepared koumiss is obtainable, but reliable statistics are at present wanting with reference to its merits compared with those possessed by the koumiss prepared on the Steppes.

1398. *In Chronic Gastro-intestinal Catarrh*, koumiss possesses great value. Stange cites numerous cases which clearly indicate the very great utility of koumiss in this class of cases.

1399. *In Typhoid Fever*, koumiss is, according to Sambrschitsky, very useful; he employed it during the pyrexial state.

1400. *In Bright's Disease*, and many other affections when nutrition is seriously impaired—*e.g.*, *Scrofula*, *Rickets*, *Chlorosis*, &c.—koumiss, it is said, has promoted an increased tissue change, and benefited the patient. In *Pregnancy*, koumiss does not seem contra-indicated, as was at one time thought, but many authorities advise against the employment of koumiss in diseases of the *Heart and Great Vessels*.

1401. Krameriæ Radix. Rhatany Root.

Med. Prop. and Action. Powerful and valuable astringent; its virtues chiefly residing in tannin, of which good specimens contain about 40 per cent. It likewise contains a peculiar acid (Krameric Acid). In the form of powder, it forms a useful astringent ingredient in dentifrices. When chewed, it tinges the saliva red.

Dose:—*Of the Extract*, gr. v.–xx. *Of the Infusion*, f℥j.–ij. *Of the Tincture*, ♏xxx.–lx.

1402. *Therapeutic Uses. In Atonic or Passive Hæmorrhages*, rhatany, either in the form of infusion or extract, has been found in some cases to act very beneficially. *In Hæmaturia*, it was found by Sir T. Watson (ii. p. 668) to be effectual, after all ordinary measures had failed. He gave it in scruple doses of the extract, thrice daily. *In Passive Hæmorrhage from the Intestines*, it was successfully employed by Lombard, of Geneva; and M. Rilliet relates two cases of *Intestinal Hæmorrhage in New-born Infants* which were cured by injections of the infusion of rhatany, and compresses soaked in the same, applied to the abdomen.

1403. *In Leucorrhœa*, attended by relaxation of the tissues generally, and by debility, the extract, in doses of gr. xx. daily, proves serviceable in arresting the discharge, and giving a healthy tone to the system. The infusion may, at the same time, be used as an astringent injection.

1404. *In Chronic Diarrhœa*, it has been successfully employed by Dr. Hurtado[1] and other Spanish physicians. It appears to be

[1] Journ. de Méd. t. xxxvii. p. 216.

chiefly useful when the stools are mucous and slimy, and in the absence of all inflammatory action.

1405. *In Fissures of the Anus*, rhatany, in infusion as an injection and in ointment (ext. 1–2 to 5) as a local application, has been lauded by Trousseau and other French physicians, but it is doubtful if it possesses any advantage over tannin (*q.v.*).

1406. *To Sore or Fissured Nipples*, an ointment of rhatany (1 part of extract to 15 of cocoa butter) is stated to be a very efficacious application.

1407. *In Spongy and Bleeding Gums*, the powder has been employed as a dentifrice; the tincture is also a good application. The infusion forms a useful gargle in some forms of *Relaxed Sore Throat.*

1408. *In Superficial Tonsillitis*, a rhatany lozenge, containing about gr. iij. of the extract, taken every three or four hours, will materially hasten the cure. (Dr. Morell Mackenzie, p. 57.)

1409. Lactic Acid. A colourless, odourless, syrupy, sour liquid, obtained by the action of a peculiar ferment upon a solution of sugar. Sp. gr. 1·21. It is miscible with water, alcohol, and ether, and coagulates milk and albumen. The so-called "*medicinal* lactic acid" sold in shops is in a diluted form (1 of the acid and 6 of water). Non-attendance to this distinction has probably led to the discrepancies in the results obtained from the lactic acid in this country as compared with those recorded on the Continent in diabetes, &c. (Martindale.)

Med. Prop. and Action. Digestive. Stomachic? in doses of ♏v.–xx. or more well diluted. (See Dyspepsia, *infra.*) Soporific powers have been attributed to it and its salts by Preyer,[1] but the experiments of Senator[2] and others have shown them to be very feeble and uncertain. Dr. Senator's observations tend to confirm those made by Dr. Richardson[3] in 1857, to the effect that the excess of lactic acid in the blood is the proximate cause of acute rheumatism. Lactic acid was introduced into the British Pharmacopœia in 1885, and a dilute acid prepared from it.

Dose:—Of the Dilute Acid, ʒss.–ij.

1410. *Therapeutic Uses. In Dyspepsia*, lactic acid may with propriety be used as an adjuvant to pepsine in half-drachm doses twice daily. (Dr. H. Wood, p. 106.) According to Dr. C. Handfield Jones,[4] it is indicated chiefly in cases of irritative dyspepsia, when the digestion is painful and imperfect, and has been so for some time; he found it of little use in recent cases. It is best taken at meal-times (♏xv.–xxx. in ʒss. of water).

1411. *In Diabetes*, lactic acid conjoined with a rigid meat diet proved highly successful in the hands of Dr. Cantani, of Naples, and other Italian physicians. The trials of this treatment by Dr. G. W. Balfour,[5] of Edinburgh, were on the whole satisfactory,

[1] Centralb. Med. Wissens. 1875, p. 578.
[2] Berlin Klin. Wochens. 1877, p. 537.
[3] Med. Times, Nov. 28, 1857.
[4] Assoc. Med. Journ. July 14. 1854.
[5] Edin. Med. Journ. Dec. 1871.

two patients having been cured by its means. It has not, however, come into general use, and little reliance is to be placed upon it.

1412. *In Diphtheria*, Dr. Morell Mackenzie (p. 164) regards lactic acid as the most reliable of all solvent applications, a fact which had previously been pointed out by Dr. Dureau.[1] He applies it freely with a brush, or by means of lint attached to a rod, and he states that he has never met with the ill effects described by Küchenmeister—namely, ulceration of the mucous membrane of the lips and mouth. Others have recommended its application in the form of spray. In the first stage of *Croup*, the child having been placed in a warm, well-ventilated room, Dr. Mackenzie (p. 179) directs the employment of spray inhalations of lactic acid (♏xx., Aq. ℥j.), to be given at least every hour, and continued five minutes at a time. At the same time he directs an ice-bag to be applied to the neck and ice to be constantly sucked. Dr. A. Weber[2] testifies to the value of lactic acid inhalations in these cases.

1413. *In Chronic Cystitis and Vesical Catarrh*, lactic acid has proved successful in the hands of Dr. Deecke[3] in doses of one to two grams (gr. xv.–xxx.) in sweetened water or buttermilk thrice daily. He states that it rapidly arrests the ammoniacal decomposition of the urine, within as well as outside the bladder, dissolves the salts, destroys the microscopic vegetables which develop there, and in consequence acts efficaciously upon the catarrh of chronic cystitis. He used it also as an injection (½ to 1 per cent.) thrice daily.

LEECHES. See HIRUDINES.

1414. LEPTANDRIN. A dark-greenish, resinoid powder obtained from the root of Leptandra Virginica, *Nutt*, a scrophulariaceous plant of North America, *vulgo* Culvers. It excites the liver, and promotes the flow of bile, without any irritation of the bowels. Reputed useful in *Dyspepsia*, *Diarrhœa*, and *Cholera Infantum*, in doses of gr. ss.–ij. twice or thrice daily in form of pill with glycerine of tragacanth.

1415. LINUM USITATISSIMUM, *Linn.* Common Flax.

Med. Prop. and Action. The seeds (Lini Semina, Linseed) are demulcent and emollient, and may conveniently be given in infusion (gr. clx., Liquorice Root gr. lx., Aq. ℥x.) with sugar, lemon, &c., to taste, in doses of f℥ij., several times daily. If drunk largely, it assists the action of other diuretics. The oil expressed from the seeds (Lini Oleum, Linseed Oil) is emollient and laxative in doses of f℥ss.–j. It is rarely given internally, excepting in the form of enema. The farina of the seeds, after the oil has been expressed (Lini Farina), commonly known as *Linseed Meal*, is extensively employed in the formation of poultices. For this purpose, mix linseed meal (℥iv.) gradually with boiling water (f℥x.), and then add olive oil (℥ss.), constantly stirring till uniformly mixed.

1416. *Therapeutic Uses. In Catarrh, Diarrhœa, Dysentery, Visceral Inflammations, Calculus, Ardor Urinæ, Gonorrhœa, and*

[1] Practitioner, Nov. 1868.
[2] Med. Times, Jan. 22, 1870.
[3] Dublin Med. Journ. June 1880, and Practitioner, Sept. 1881.

Affections of the Genito-Urinary Organs, the infusion of linseed is an excellent demulcent, and its value is greatly enhanced by being generally procurable.

1417. *In Pneumonia, Bronchitis, Pleuritis, Pericarditis*, also in *Hepatitis, Peritonitis, Enteritis*, and *Nephritis*, and in *Uterine* and *Ovarian Inflammation*, great benefit often results from the prolonged use of linseed meal poultices, made as light and soft as possible, and sufficiently large thoroughly to cover the affected part. They not only afford present relief, but appear to exercise a favourable influence on the course of the disease. Treating of *Puerperal Fever*, Dr. Mathews Duncan[1] observes: "The hot linseed-meal poultice is almost always a grateful and useful application to the hypogastric region, relieving pain, and promoting the lochial flow." Besides, when the skin is hot and dry, it is a valuable diaphoretic. Where it is desirable to stimulate the skin, a portion of mustard (1 to 4) may be added; where much pain has to be subdued, they may be made with decoction of poppy in place of water, or a little laudanum or belladonna may be smeared over the surface. They are chiefly applicable in the earliest stages of the inflammation; in the more advanced stages, except in nephritis, blisters are more serviceable. Applied to *Abscesses*, they promote the suppurative process.

LITHARGYRUM. See PLUMBI OXIDUM.

1418. LITHII CARBONAS. Carbonate of Lithia.

Med. Prop. and Action. Alkaline diuretic and antilithic. The value of lithia is said to depend on its affinity for uric acid, on its small combining proportion, and on the ready solubility of the urate of lithia. According to Dr. Ure and Dr. Garrod, the lithia salts are more powerful solvents of uric acid than either potash or soda, but this is not in accordance with the observations of Dr. W. Roberts,[1] who ranks potash first, soda next, and lithia last as uric-acid solvents. Dr. Garrod, however, still maintains his views.[2] It may be continued for a lengthened period without producing any ill effects. The usefulness of the waters of Baden-Baden in gouty and allied affections is attributed largely to the lithia salts they contain.

Dose:—Of the Carbonate, gr. iij.–vj. in ℥iij. of aerated water; *of the Citrate*, gr. v.–x., diluted.

1419. *Therapeutic Uses. In the Uric-Acid Diathesis, and Diseases incidents therewith*, e.g., *Gouty and Calculous (Uric-Acid) Affections*, Dr. Garrod has for upwards of twenty-five years insisted on the value of lithia salts, and he states that he is convinced that by their employment depositions of uric acid in the renal organs can to a very large extent be prevented. Free dilution and administration on a fasting stomach are mentioned by Dr. Garrod as points of much importance in the employment of this and other alkaline remedies. It is to the neglect perhaps of these points that others have failed to obtain the good effects claimed for this remedy by Dr. Garrod. Dr. Wood (p. 597) states that, given as prescribed by Dr. Garrod for a length of time, it has appeared to him to do great

1 Lancet, Nov. 6, 1880. 2 Med. Times, June 23, 1883.

good in some cases of *Chronic Gout*. A solution (gr. v., Aq. ℥j.) applied on lint to *Gouty Concretions* or *Enlarged Joints*, and covered with oiled silk, has been thought to be useful in some cases. Lithiated vesical injections in cases of *Uric-Acid Calculus* were advised by Dr. Ure, but their utility is very doubtful.

1420. LOBELIA INFLATA, *Linn.* Lobelia.

Med. Prop. and Action. The dried herb is officinal. In doses of gr. j.–v. of the powdered leaves it is sedative, sudorific, and expectorant; of gr. xv.–xx. it acts as an emetic or cathartic; and in larger doses it is an acro-narcotic poison. It is best given in simple or ethereal tincture. Of the simple tincture, f℥ij. act as an emetic. If a leaf or capsule be held in the mouth for a short time, it brings on giddiness, headache, a trembling agitation over the whole body, sickness, and finally vomiting. These effects are analogous to those which tobacco produces in those unaccustomed to its use. If swallowed in substance, it excites speedy vomiting, accompanied by distressing and long-continued sickness, and even with dangerous symptoms, if the dose be large. It is extremely unequal in its operation; in some, causing, even when given in small doses, serious constitutional disturbance; whilst in others, large doses are taken with little perceptible effect. As there are no means of determining the cases in which its operation will be thus violent, it is always advisable to commence with small doses, and to increase them as the patient is able to bear the medicine, discontinuing its use if it cause nausea, or great depression, or intermittent pulse. Children appear to be more tolerant of its action than adults. Its activity appears to depend upon two principles—1, *Lobelin*, a principle much resembling nicotin; and 2, a volatile oil, or peculiar acid, *Lobelic Acid*.

Lobelia may be given in *Tincture*, ♏x.–xxx. as a sedative and expectorant; f℥j.–jss. as an antispasmodic and emetic. *Of the Ethereal Tincture*, ♏x.–xxx.

1421. *Therapeutic Uses.* *In Asthma*, lobelia is by some held in high esteem. There is, however, a want of uniformity in its action. Dr. Hyde Salter reports favourably of the tincture given in repeated doses every half-hour, increasing the dose, ♏v. each time, till either the physiological effects (faintness, sickness) are manifested with or without relief, or that relief is obtained without such symptoms. In either case, the medicine is at once to be discontinued. Generally, no relief takes place till symptoms of lobelia poisoning show themselves. Any amount may be given short of producing these effects without any relief at all. The quantity required differs in each case—generally ♏l.–lx. suffices; in others, ♏xc. fail to produce an effect. When once the necessary dose has been ascertained in this way, Dr. Salter directs the patient, on the next occasion, to start with that dose, which generally has the desired effect at once. Two circumstances render great caution in the use of this remedy necessary—1, Some persons exhibit great intolerance to its action, poisonous effects following the smallest doses; and 2, Different specimens differ considerably in strength. In cases which tolerate it well, it is a remedy of great value. From its depressing action on the heart, it is contra-indicated in cardiac asthma. Dr. Ringer, who reports highly of its efficacy, considers that it should be given with caution where heart disease exists, as the pulse may become irregular, and very weak.

1422. *In Chronic Bronchitis*, it proves in many instances very serviceable as a sedative, by allaying spasm, and facilitating expectoration. It may be given in combination with other remedies. It is often effectual in allaying the *Dyspnœa of Emphysema*, but is inapplicable if heart disease is present. In the same way it proves useful in *Chronic Pneumonia*.

1423. *In Hooping Cough*, Dr. Ringer speaks favourably of lobelia in large doses during the spasmodic stage. For a child aged two, he prescribes ℥x. of the tincture every hour, with an additional dose each time the cough comes on, if there be sufficient warning to accomplish this. By these means, he states, the severest attacks are immediately made much milder, while in no instance has it been found to produce the unpleasant symptoms witnessed in adults; hence it may be concluded that lobelia is better borne by children than by adults. *Other forms of Paroxysmal Cough* are often greatly benefited by its use. *In Hay Fever*, Mr. Gordon, of Welton, found the tincture an effectual remedy.

1424. LUPULINUM. Lupuline. The yellow pulverulent substance separated from the strobiles of Humulus Lupulus (Hops) by the process of rubbing and sifting.

Med. Prop. and Action. Tonic, sedative, and anaphrodisiac. It produces neither headache, nervousness, constipation, nor any other unpleasant symptoms; in which respect it is superior to camphor. Incorporated in the B. Ph. of 1885.

Dose, gr. ij.–v. in powder with sugar, or in pill. By long keeping, it loses much of its efficacy.

1425. *Therapeutic Uses. In Nervous Affections*, when opium cannot be tolerated, Eberle found lupuline peculiarly useful. *In Chronic Hysteria, attended with Morbid Vigilance*, he states it, in doses of gr. x. every six hours, affords great relief, without causing any unpleasant effects.

1426. *In certain Irritable States of the Generative Organs*, it is a remedy of great value. *In Gonorrhœa*, it is effectual not only in removing *Chordee*, but in allaying irritation of the inflamed mucous membrane of the urethra. Whenever it is desirable to keep the penis at rest, as in cases of *Chancre, after the operation of Phimosis, during the Treatment of Stricture, &c.*, lupuline, in doses of gr. v.–x., or even gr. xv., may be resorted to with advantage. *In Spermatorrhœa*, it is a remedy of great power, given in doses of gr. xv. at bedtime. It has also been found very serviceable in mitigating the *Urethral Irritation and Discharges consequent on former Excesses*, more so indeed than either iron or quinine. A valuable peculiarity in the operation of lupuline is the beneficial action it exerts on the digestive process, which is so often at fault in these cases. *In Nymphomania*, it seems well worthy of a fair trial. Herzfelder used it with advantage in *Nocturnal Incontinence of Urine*.

1427. LUPULUS. Hop.

Med. Prop. and Action. Tonic, stomachic, diuretic, and slightly narcotic.

Dose:—Of the Extract, gr. v.–xv. *Of the Infusion*, f℥j.–ij. *Of the Tincture* f℥ss.–ij.

1428. *Therapeutic Uses.* See LUPULINUM.

1429. MAGNESIA PONDEROSA. [B. Ph. 1885.] Heavy Magnesia.
MAGNESIA LEVIS. Light or Calcined Magnesia.

Med. Prop. and Action. Antacid, in doses of gr. x.–xx.; laxative, in doses of gr. xxx.–gr. lx.–gr. xc.; for a child the dose is from gr. ij.–x. It is supposed by Hufeland to possess, in addition to its antacid, a specific property of diminishing gastro-intestinal irritation, by a directly sedative action. As an antacid, it is preferable to the carbonate, as the latter, when brought in contact with the acid of the stomach, gives rise to much flatulence. After exerting its antacid effects in the intestinal canal, it becomes absorbed, and renders the urine alkaline. It is, therefore, of use in increased excretion of uric acid and urates. As an aperient, it is mild and unirritating, and is well adapted for children; it may be given alone in a little milk, or combined with a few grains of rhubarb. It is an antidote *in poisoning by the mineral acids.*

1430. *Therapeutic Uses.* The same as Magnesii Carbonas (*q.v.*).

1431. MAGNESII CARBONAS LEVIS. Light Carbonate of Magnesia.
MAGNESII CARBONAS PONDEROSA. [B. Ph. 1885.] Heavy Carbonate of Magnesia.

Med. Prop. and Action. Purgative, in doses of gr. xx.–gr. lx.; antacid from gr. v.–gr. xx. It is particularly adapted as a purgative for children, in doses of gr. ij.–v., and may be given in aq. anethi, or combined with rhubarb. Milk is also a good vehicle for it. Its purgative action is supposed, in a great measure, to arise from the magnesia combining with the acids of the alimentary canal, forming with them soluble compounds. If given in large and continuous doses, it may prove hurtful by accumulating in the intestines. Sir B. Brodie mentions a case in which, after death, many pounds of magnesia were found collected in the colon, above a contracted part of the rectum. It may be advantageously exhibited in the form of Fluid Magnesia, in doses of f℥j.–ij. Each f℥ contains about gr. xiij. of the carbonate. F℥j., mixed with citric acid or lemon-juice, forms an agreeable effervescing aperient.

Doses:—Magnesia levis, gr. x.–lx. *M. ponderosa*, gr. x.–lx. *Magn. Carb. levis*, gr. x.–lx.; *M. carb. ponderosa*, gr. x.–lx.

1432. *Therapeutic Uses. In Acidity*, gr. xx. of carb. of magnesia in some aromatic water or mild bitter infusion, proves eminently serviceable. *In Sympathetic Vomiting, particularly in that of Pregnancy*, attended with acidity, it also occasionally affords complete relief; and *in Cardialgia* arising from the same cause, it is often successful when other means have been unavailing. It is best taken immediately after a meal. *In Pyrosis*, it is occasionally effectual.

1433. *In the Diarrhœa of Children*, it proves valuable as an antacid and absorbent. It is best combined with a few grains of rhubarb and an aromatic. With aq. anethi it often proves effectual in relieving *Flatulence* and *Flatulent Colic*. *In Aphthæ and Aphthous Ulceration*, it may also be given with advantage.

1434. *In Chronic Gout,* magnesia and its carbonates are often of great service. It forms a moderately soluble salt, with uric acid: it is also an alkali, and acts both as a direct and remote antacid: it is useful as an adjunct, especially when there is great acidity of the intestinal canal, and a sluggish state of the bowels. The salt formed in the stomach by its union with the acid, produces a purgative effect, which tends to relieve the portal circulation, and often aids indirectly the function of the kidneys. Carbonate of magnesium dissolved in excess of carbonic acid, is an elegant form of administration.

1435. *In Poisoning by Oxalic and the Strong Mineral Acids,* it is a valuable antidote, but not superior to chalk.

1436. *Warts,* according to Dujardin-Beaumetz,[1] disappear in the course of a few weeks under the use of gr. x. of calcined magnesia taken fasting every morning. He advises that it should be given once or twice a week for a month after the warts disappear to perfect the cure.

1437. MAGNESII CITRAS. Citrate of Magnesia. May be formed extemporaneously by mixing the solutions of 240 grs. of Citric Acid and 210 grs. of Magnes. Carb. and evaporating.

1438. *Therapeutic Uses. In Febrile and Inflammatory Attacks in the Puerperal state,* when a mild refrigerant is required, the following may be employed:—℞ Acid. Citric. gr. xxx., Aq. ℥j., Syr. Aurant. f℥ij. Add this to ℥x. of fluid magnesia, and drink whilst effervescing.

1439. *In Nervous and Dyspeptic Headaches,* a dose of the effervescing citrate is often very effectual. It should not be had recourse to frequently, as constant repetition is likely to injure the tone of the gastric mucous membrane.

1440. MAGNESII SULPHAS. Sulphate of Magnesia. Epsom Salts.

Med. Prop. and Action. Purgative, in doses of gr. cxx.-℥ss., dissolved in Oss. of water or infusion of senna. A smaller relative dose is required if the salt be largely diluted; thus, ℥ss. of the salt, in Oj. of fluid, acts quite as powerfully as double the quantity in only Oss. of fluid. It is a refrigerant purgative, lowering the force of the pulse, and producing a small degree of depression. It is apt to produce flatulence, to avoid which it should be given in some aromatic water. If it excite vomiting, this may generally be obviated by the addition of a few drops of dilute sulphuric acid, which, at the same time, materially increases the purgative action of the salt; it is best given in combination with senna, whose purgative effect it promotes, at the same time that it modifies its griping tendency. The compound infusion of roses is a good vehicle for its administration. Röhrig regarded it as an hepatic stimulant, but from the experiments of Rutherford,[2] so far from increasing, it diminishes the secretion of bile. It is supposed to operate chiefly on the duodenum. By moderate exercise in the open air, while taking this salt, its purgative operation is diminished, and its diuretic effect increased. It should not be administered during a cholera epidemic, as it is apt to occasion too profuse and exhausting

[1] Bull. Gén. de Thérap. March 15, 1883. [2] Practitioner, Nov. 1879.

evacuations, and thus to bring on an attack of that disease. Natives, and inhabitants of the tropics, generally bear the operation of Epsom Salts very badly; it induces in them a great depression of the system, and often exhausting purgation. It is best adapted for febrile and inflammatory attacks occurring in persons of a robust, plethoric habit. In small doses and freely diluted, it acts as a diuretic. It is an antidote *in poisoning by the salts of lead and barytes.* It is sometimes employed in the form of enema (ʒj., Olive Oil ʒj., Mucilage fʒxv.).

Dose:—As a purgative, gr. cxx.–ʒss.; as a diuretic, gr. xx.–gr. xl., freely diluted.

1441. *Therapeutic Uses. In the early stages of Acute Febrile and Inflammatory Diseases,* where the patient is young and robust, and purgatives are indicated, the sulphate of magnesia, variously combined, forms an eligible remedy, but it is a powerful depressant, and as a general rule inferior to compound jalap powder. *Obstinate Constipation* will sometimes yield to small, frequently-repeated doses of the salt, with the addition of a few drops of diluted sulphuric acid, when stronger purgatives have failed to produce any effect. It is thought to be specially useful in the *Constipation and Colic of Lead-poisoning.* From half to one teaspoonful in a tumblerful of tepid water half an hour before breakfast is useful in treatment of habitual constipation.

1442. *In Dyspepsia, accompanied by Costiveness,* the sulphate of magnesia, in small doses, has been found very effectual. The best mode is to dissolve ʒj. in Oiss. of infusion of gentian or quassia, with the addition of fʒij. of aromatic spirit of ammonia, and of this to drink a wineglassful every morning fasting.

1443. *In Menorrhagia,* a mixture containing very small doses of this salt, with a little diluted sulphuric acid and syrup, is exceedingly useful during the days of profuse catamenial flow. (Dr. Graily Hewitt.) When associated with debility, it should be given with tonics, especially sulphate of iron. *In the severer forms of Jaundice,* Dr. Budd recommended the following purgative:—℞ Magnes. Sulph. gr. xxx.–lx., Magnes. Carb. gr. xv., Spt. Ammon. Arom. ℥xxx., Aq. ʒx. M. To be taken thrice a day.

Magnesii Sulphis. See Sodii Sulphis.

1444. Malt. Malt extract.

Under this heading it is proposed to consider the therapeutic and pharmacological bearing of the malt extracts in promoting salivary and pancreatic digestion, while we reserve the pharmacological aspects, of peptic or stomach digestion to the article "Pepsine."

Much of the information concerning these questions is gleaned from the work on "Ferments," by Dr. William Roberts, of Manchester, as well as from various papers from the same pen.

The food consists of three main classes—the starches and sugars, the proteids (flesh) and the fats. Mouth and gullet digestion is concerned mainly in breaking up food into particulate and accessible forms, and in converting starches into sugar or bye-products.

In the stomach (see Pepsine) it would appear that the process of starch-to-sugar conversion is stopped. This is, however, resumed or re-initiated in the intestines by means of the pancreatic juice. The nature of this starch-to-sugar conversion is one of fermentation. Diastase (ptyaline—ferment in pancreas) is a ferment which acts in the mouth and in the intestine, in the one case existing in the saliva, in the other present in pancreatic juice. It need not be here further dwelt upon than to say that we need most of food stuffs producing sugar or sugar-like bodies, and hence inability to conduct amylolytic digestion (starch-to-sugar conversion) induces the worst form of tissue starvation.

Pathological conditions arise in which less amylolytic action can occur, or in which the organism needs more of the products of this process to occur. Therapeutics have to meet and remedy these conditions. In the one case, the secretions have to be returned to their normal condition; in the other, materials have to be supplied more or less digested.

Extract of malt has been used for this purpose. It contains sugary material, together with a large quantity of diastase, so that by its introduction into the body it supplies sugary food in a concentrated and easily assimilable form. This ferment, however, acts in alkaline solutions. If its power be destroyed in the acid secretion of the stomach, of what use is the mouth administration of malted foods? Observers differ in opinion. Defresne believes that diastase is rendered dormant, not destroyed, after being subjected to the action of pepsine and hydrochloric acid. Dr. Roberts, although holding an adverse view to this, still admits that diastase remains active in feebly acid fluids. During peptic digestion, acidity only becomes well marked at its later stages, and hence, if starches and sugars with diastase be introduced into the stomach at the commencement of a meal, they are amply digested. Malted foods further possess an essential quality of easy saccharification; they present starchy material freed from the insoluble husks which enclose raw starch. With regard to the value of malt extracts as foods, Dr. Roberts places them upon a par with syrups. They possess, however, uses other than as a simple food. While supplying tissue-forming material, they are a most useful vehicle for other food stuffs, such as cod-liver oil, &c. In exhausting diseases—*e.g.* Phthisis, they exhibit the most marked beneficial effects upon the patient. They act in supplying food, in helping him to digest his other starchy foods. This last function must not be undervalued, nor will it if we bear in mind that in all exhausted states the secretions become either lessened in quantity or impaired in quality.

We have already considered the action and uses of malted foods; we have now to enter upon those subserved by pancreatized diet. The pancreatic juice possesses diverse properties. It owns an amylolytic ferment (starch-to-sugar conversion): it also peptonizes fleshy foods: it possesses a milk-curdling ferment: it can emulsify fats.

We are alone concerned with its amylolytic ferment. As we have shown above, saccharification takes place in alkaline or feebly acid solutions; pancreatic juice exercises all its powers under the same circumstances. Its wide range of digestive power recommends its use in preparing foods which are composite in nature (*e.g.*, milk). Pancreatized foods (see Pepsine) are, unlike malted foods, best given after a meal, and administered with an alkali. But their preparation and modes of administration will be fully described below (see Pepsine).

Properties, Uses and Preparations. The kind of malted food employed is by no means matter of slight importance. A temperature above a certain range destroys the ferment action of diastase, and as some of the malted foods of commerce are prepared without regard to this point, their value as digestives is lessened or abolished. The mode of preparation is thus described:—The various extracts, which are in reality merely concentrated infusions of malt, are, after due soaking under water, evaporated in vacuo at a low temperature. They are usually of a light brown colour, viscid, and of an agreeable sweetish taste. Analysis shows the average yield of maltose is 70% of salts, diastase and water 6%, with an undeterminable quantity of proteid material.

1445. *Therapeutic Uses. In various forms of Dyspepsia.* It has been indicated above that malt extracts are most valuable in the dietetic treatment of patients whose *digestion is at fault.* This may arise from (i.) impoverished blood—*Anæmic, Spanæmic,* and *Chlorotic states;* (ii.) *Convalescence from Disease* when the *Digestion is weak, not impaired;* (iii.) *Exhausting Diseases,* when coupled with increased demand for tissue-forming material and a lack of digestive power. Children take malt extracts well, and thrive upon them. Some patients like the malt extract in from ʒj. to ʒss. doses alone, but we have found that if stirred in porridge, bread sop, or smeared over bread it is easily taken and relished. In either case it should be given before or quite at the commencement of a meal. It has been given in cases of *Diabetes,* upon the theory that saccharuria indicates mal-nutrition and mal-assimilation of sugars, due possibly to an imperfect or perverted starch-to-sugar conversion. There is, however, nothing to support this view, nor does clinical evidence show malt extract of benefit in diabetes. Perhaps one of the best uses of malt extracts is that cod-liver oil can be administered with them in so perfect an emulsion that even microscopic examination fails to detect oil globules. As stated above, the value of the malt extracts of commerce varies immensely, some being absolutely without diastase. The most reliable may be taken in the following order of merit:—Hoff's Extract of Malt, and those bearing the name of Kepler, Squire, and Trommer.

1446. Manganesii Oxidum Nigrum. Black Oxide of Manganese.

Manganesii Sulphas. Sulphate of Manganese.

Med. Prop. and Action. Alterative-tonic, hæmatinic, and sedative. According to the researches of M. Hannon, there is a close similarity in properties between manganese and iron, and they are applicable to the same class of cases. In one respect, however, he found them to differ, manganese not being found in the fæces of persons who have taken it, or at least in very

small quantities. Neither does it cause constipation, as some of the iron salts do. *In simple Anæmia*, he found it act as beneficially and as rapidly as iron, and the benefit appeared to be more permanent. It should not, however, be persevered in so long as iron, as its salts are more rapidly assimilated. Dr. Leared remarks, the ordinary black oxide is very impure, and unfit for use; it should, therefore, be prescribed in a purified state. The carbonate (gr. x.) and the sulphate (gr. v.) have also been employed, but in these doses have been found to induce gastric irritation, whilst the black oxide is easily borne. From some experiments Dr. Goolden[1] made with the sulphate, it appeared to him to exercise a specific influence on the liver and gall-bladder, but according to Dr. Rutherford[2] it stimulates, not the liver, but the intestines. Externally it is used in the form of ointment (gr. lx.–gr. cxx., Lard ʒj.) or gargle (gr. cxx.–clxxx., Barley Water fʒvj.).

Dose, gr. iij.–gr. x.–gr. xx., thrice daily.

1447. *Therapeutic Uses. In Chlorosis and other Anæmic states*, manganese has been employed as a substitute for iron, but with very varying results; in some cases, however, it has been found that the two given conjointly yielded results which were not obtainable by either of them given singly.

In Amenorrhœa the binoxide in gr. iv. pills, one four times daily, is stated by Dr. Ringer[3] to be equally efficacious with the permanganate of potash (*q.v.*). It does not apparently act by improving the condition of the blood, as it succeeds equally well in the plethoric and anæmic.

1448. *In Liver Affections*, in *Hepatic Dropsy*, and *Hypochondriasis*, Dr. Goolden, after an experience of thirty years in its use, lauds the sulphate as a good substitute for calomel and other mercurials. He found it useful in *Hæmorrhoids* and other congestions arising from derangement of the portal system. He places the average dose at gr. x. in a tumblerful of effervescing mixture: this will produce copious bilious stools, without griping or depression. Five-grain doses may be repeated as an alterative instead of blue pill.

1449. As a remedy *in certain irritable conditions of the Stomach and forms of Dyspepsia, Gastrodynia, Pyrosis, &c.*, the oxide has been strongly recommended by Dr. Leared. Corroborative evidence as to its value in cases of *Gastric Irritation* is given by Dr. Goddard Rogers, but some of his patients found the medicine so gritty and unpleasant that they could scarcely continue it. The dose employed was gr. x.–xv., thrice daily.

1450. Maticæ Folia. Matico Leaves.

Med. Prop. and Action. Astringent; a powerful topical styptic. Matico contains only traces of tannic acid, a peculiar acid *Artanthic Acid*, and a volatile oil. As an internal remedy, its astringent properties are not well marked, as, though it acts externally as a reliable hæmostatic, the effect is probably due rather to the mechanical action of the leaf than to astringency. For external application, the underside of the leaf should be used, being more powerfully styptic than the upper. The powdered leaves are also frequently used. It was introduced into England by Dr. Jeffreys, in 1839. Much interesting information on its properties will be found in a valuable paper by Prof. Bentley, in Pharm. Journal, 1863.

Dose:—Of Powdered Matico, gr. xxx.-gr. cxx. *Of the Infusion*, fʒj.-iv.

[1] Lancet, June 15, 1878. [2] Practitioner, Nov. 1879. [3] Lancet, June 6, 1883.

1451. *Therapeutic Uses. In Internal Hæmorrhages*, it has not fulfilled the hopes which Dr. Jeffreys and others entertained of it when it first came into use; still there are cases in which it proves useful. *In Menorrhagia*, Dr. West (p. 65) ranks it in value next to gallic acid and ergot. He prescribes the infusion in ʒiss. doses every 4 hours. He considers it most useful in the menorrhagia of young married women, and of anæmic subjects. For controlling *Hæmorrhage in Cancer of the Uterus*, injections of the infusion are also stated by Dr. West (p. 401) to be of much service. In slight cases of *Hæmoptysis*, Dr. Theophilus Thompson[1] observes that the infusion of matico alone is often sufficient. Sir H. Thompson regards the infusion of matico in doses of fʒij. every two or three hours equal to gallic acid, lead, &c., in *Hæmaturia*. He speaks also of having, in some exceptional cases, arrested the hæmorrhage by injections of an iced infusion of matico, immediately after removing the clots from the bladder.

1452. *Hæmorrhage from Leech-bites, from Superficial Wounds, after the Extraction of Teeth, &c.*, may be readily arrested by the local application of the underside of the leaf.

1453. Meconic Acid. Acidum meconicum. B. P. 1885. Prepared from Opium.

Med. Prop. and Action. Occurs in micaceous scales nearly colourless, and sparingly soluble in water. The officinal preparation from meconic acid is Liquor Morphinæ Bimeconatis. The researches of Sertürner, who discovered meconic acid, and those of Sömmering and Albers are at variance, for, while the first named finds it poisonous, the latter assert that frogs are slowly affected, give evidence of stupor, and finally become convulsed. Meconic acid is itself not employed as a therapeutic agent.

1454. Mentha Piperita. Peppermint. Mentha Pulegii. Penny-royal. Mentha Viridis. Spearmint.

These three plants agree closely in botanical character, and in their medicinal properties.

Med. Prop. and Action. All three are aromatic, stimulant, carminative, and stomachic. The volatile oils in doses of mj.–v. are used as stimulant stomachics, and as adjuncts to purgatives. The distilled waters (ʒj.–ij.) are carminative, and are much used as vehicles for saline aperients. The officinal spirit of peppermint is a good form for administration. The dose of the essence is mx.–xx. Mentha pulegii and its oil, though equally useful with the other two, is not officinal in B. Ph.

Dose:—Of the Spirit, ʒss.–j.

1455. *Therapeutic Uses. In Flatulence, Flatulent Colic, Nausea, and Spasmodic Affections of the Bowels*, the volatile oil of these plants (it is not a matter of importance which is selected) may be given with advantage. A few drops of laudanum may be conjoined, according to the urgency of the symptoms. Their efficacy is often increased by the addition of magnesia.

1456. *In Neuralgia*, oil of peppermint is a common application amongst the Chinese, who apply it to the seat of pain with a camel-

[1] Lancet, July 19, 1851.

hair pencil. Dr. A. Wright[1] states that he has frequently tried this practice, not only in *Neuralgia*, but in *Gout*, and with remarkably good results, the relief being, in some instances, almost instantaneous. Dr. Meredith[2] speaks confidently of the speedy relief it affords to the neuralgic pains of *Herpes Zoster*, freely painted over the affected part.

1457. MENTHOL. A crystalline stearoptine derived from the fresh herb of Mentha arvensis.

Med. Prop. and Uses. It occurs in colourless acicular crystals. It is sparingly soluble in water, but far more so in rectified spirit, in ether and chloroform. Fixed and volatile oils dissolve menthol. When placed on the skin it causes a sensation of chilliness, almost amounting to benumbing. It acts as a stimulant when taken by the mouth. It is said to possess antiseptic powers. Its main use in medicine is as an anodyne, chiefly in cases of neuralgia. Menthol was introduced into the Brit. Pharm. in 1885. Preparations and modes of employment:—Menthol, gr. ss. to gr. ij., may be given as pill with soap. As a liniment alone, or combined with chloroform, menthol occurs largely in the Chinese neuralgia remedy, Po-ho-yo. Po-ho-yo is used externally smeared over the part affected; or cotton-wool soaked in it is applied to the carious tooth should one exist.

Dose, gr. ss.-ij.

1458. *Therapeutic Uses. In all forms of Neuralgia*, especially in *Sciatica, Lumbago, Toothache, &c.*, menthol is of undeniable value. A solution of 1 part menthol in 60 rectified spirit will, Mr. McDonald finds, remove *Facial Neuralgia* when painted over the painful area.

1459. *Ringworm of the Scalp.* Mr. Malcolm Morris uses menthol, and has derived great benefit from it. He employed the following formula:—Menthol ʒj., Chloroform. ʒij., Oil ʒij. A useful application is 1 part menthol and chloroform in 12 of oil.

1460. *In Gout.* The Chinese use it as a local anæsthetic in gout. Its value in this disease is recognized by Mr. Wright, of Finchley.[3]

1461. As an *Antiseptic*, menthol, from its homology with thymol, was tried in Edinburgh. It has not, however, been at all widely adopted. Nevertheless, in septic conditions, menthol would, from experiments instituted by Mr. Malcolm Morris,[4] prove to be a powerful bacteria destroyer.

1462. *Headaches. Frontal Headache*, especially when due to *migraine*, is reputed[5] to be instantly relieved by dipping the finger in the mixture following, and rubbing the forehead with it. Menthol ʒj., Alcohol ℥j., Ol. Caryoph. Ol. Cinnam. āā ♏xx.

1463. *In Chronic Joint Pain.* The pains of *Chronic Rheumatism* are very completely controlled by local applications of the above.

1464. *In Nerve Irritation*, menthol mixed with camphor forms an excellent application for painful *Neuralgic Affections*. Menthol "pencils" are also in use; they are very convenient, and can at once be traced over the seat of pain.

[1] Lancet, Nov. 19, 1870.
[2] Birm. Med. Rev. Jan. 1882.
[3] Lancet, 1879, vol. ii. p. 376.
[4] Lancet, 1881.
[5] Dubl. Journ. July 1884, quotes Therapeutic Gazette.

1465. Methyl, Iodide of.

Med. Prop. and Action. These were first investigated by Dr. Turnbull, and subsequently by Dr. B. W. Richardson, in 1867. According to the experiments of the latter, it may, when quite pure, be administered by inhalation, and, so given, it produces general anæsthesia; but if it be undergoing change, the free iodine which is evolved, causes lacrimation, salivation, and excessive bronchial secretion; in one experiment an animal died from artificial bronchitis thus induced. It may also be given by the mouth; one minim being equal to three grains of iodide of potassium. It should be prescribed in solution of pure methylic alcohol. Of all the iodides, it possesses the greatest activity of action on the body, and may be expected to be of service in *Tertiary Syphilis* specially.

Its antidotal powers in *poisoning by strychnine, morphine and the alkaloids* generally, are worthy of attention. It has been shown by How that when the iodide of methyl acts upon strychnine, brucine, morphine, and other alkaloids, it combines with them, and beautiful crystalline bodies are produced, which differ considerably in character from the salts of the alkaloids. The interesting experiments of Drs. Fraser and Brown, of Edinburgh, prove also that the iodide modifies in a remarkable manner their physiological effects. Thus it is well known that strychnine, in doses of gr. $\frac{1}{20}$-$\frac{1}{30}$, rapidly produces in rabbits violent convulsions and speedy death, whilst grs. xij. of the iodide of methyl-strychninum administered by subcutaneous injection produced no effect whatever on these animals. Fifteen grains produced symptoms, and twenty killed; but the animal died with symptoms altogether different from those produced by strychnine. In place of violent and spasmodic convulsions and muscular rigidity, the appearances were those of paralysis with complete general flaccidity. The spinal motor nerves were either paralyzed or speedily became so; and instead of the speedy occurrence of muscular rigidity, the muscles remained flaccid, contractile, and alkaline for several hours. In short, by the addition of iodide of methyl to strychnine, the toxic properties of the latter are diminished about 140 times; and the body produced possesses the physiological action of curare—viz., paralysis of the end organs of the motor nerves. Similarly, Fraser and Brown have discovered that the toxic properties of brucine, thebaine, and codeine are immensely diminished by the addition of the iodide of methyl; and that the bodies produced, instead of being, as all three of these alkaloids are, strongly convulsant, possess, on the contrary, the physiological action of curare. Morphine, as is well known, possesses both soporific and convulsant properties; its toxic action is much diminished by the addition of the iodide of methyl; its convulsant action is destroyed, but its soporific action remains. The subject is one of the deepest interest.

1466. Methylene, Bichloride of.

Med. Prop. and Uses. Anæsthetic; first brought to notice in this character by Dr. Richardson, in 1867. The following is a summary of his researches:[1] —1. It is an effective general anæsthetic, producing as deep insensibility as chloroform. 2. In action it is rather more rapid than chloroform, but to develop its effects more of it is required, in the proportion of six parts to four. 3. It produces a less prolonged second degree of narcotism than other anæsthetics. 4. When its effects are fully developed, the narcotism is very prolonged, and is reproduced with great ease. 5. Its influence on the nervous centres is uniform, and it creates little, if any, disturbance or break of action between the respirating and circulating functions. 6. Its final escape from the organism is rapid, so that the symptoms of recovery are sudden. 7. In some cases it produces vomiting. 8. Where it kills, it destroys by equally paralyzing the respirating and circulating mechanisms. 9. It interferes less with the muscular irritability than perhaps any other anæsthetic. 10. It combines with ether and with chloroform in all proportions.

Methylene has after some years' experience been discredited of many of its

[1] Med. Times and Gaz. Nov. 2, 1867.

alleged virtues. It would appear, firstly, that methylene as used to produce anæsthesia—is in fact a mechanical mixture of alcohol and chloroform, and as such shares with chloroform the property of depressing the heart's action. Methylene, again, has unhappily proved fatal in several cases, and has accordingly shown itself a dangerous and somewhat uncertain agent. No one should undertake its administration unless fully cognizant of its mode of action or unless alive to its lethal effects if allowed to reach above a certain dose.

1467. MORPHINA. Morphine. An alkaloid contained in opium, of which it constitutes the chief narcotic principle, the proportions varying from 2 or 3 to 10 or 12 per cent. It is soluble in alcohol and solutions of the caustic alkalies, but almost insoluble in water. It is rarely if ever given internally, one of the following officinal salts having replaced it in practice.

MORPHINÆ ACETAS. Acetate of Morphine. A white powder, soluble in water and in spirit.

MORPHINÆ HYDROCHLORAS. Hydrochlorate of Morphine. Muriate of Morphia. Occurs in white, flexible, circular prisms, of a silky lustre, soluble in water (20 parts) and in spirit.

MORPHINÆ SULPHAS. Sulphate of Morphine. Readily soluble in water. Made officinal in B. Ph. 1885.

Med. Prop. and Action. Analogous to but more powerful than opium, over which, as a general rule, it possesses the advantage of producing in less degree vascular and arterial excitement, less headache and vertigo, less subsequent depression, less constipation, and more quiet and refreshing sleep undisturbed by dreams. The effects of morphine and its salts, which latter are preferable as therapeutic agents to the alkaloid itself on account of their greater solubility, differ materially in different individuals, which, according to Dr. Harley, are determined by peculiarities of nervous constitution. In some the hypnotic—in others the excitant—effects on the nervous system are so equally balanced, that in moderate doses the drug has no very decided action, or, at most, only a tonic and stimulant one; effects which in increased doses may rise to active delirium. In others the hypnotic effect prevails, and the stimulant action is apparently confined to the heart. In a third class, the excitant action counteracts to a greater or less degree the hypnotic, and insomnia, with restlessness or delirium, results. Women are more liable to its excitant action than men; and amongst women, individuals of a highly emotional, excitable, and energetic temperament are those to whom opium in any form is a very distressing remedy, and when hypodermically used, a most dangerous one. Notwithstanding its similarity in its effects to opium, the morphine salts cannot be substituted in all cases for the crude drug; they are chiefly indicated when the object is to relieve nervous irritability and induce tranquillity of the system. The nausea and gastric irritability which occasionally follow their use are due to their action on the vagus nerve. Morphine proves fatal by depressing, and ultimately paralyzing, the respiratory movements. Introduced into the system by the hypodermic method, its effects are more speedily manifested than when administered by any other mode. For this purpose the acetate is the best form, with a minimum of acetic acid in hot distilled water, gr. v.-ʒj., or in glycerine in the same proportion. One minim of this will represent $\frac{1}{10}$gr., a very useful minimum dose in cases of slight neuralgic pain. Two minims ($\frac{1}{6}$ gr.) is the best commencing dose for the relief of severe pain, and as a hypnotic in states of nervous irritability. Three minims (or $\frac{1}{4}$ gr.) is an *unsafe dose to commence with*, dangerous and even fatal results having followed from such a dose. It should not be given till smaller doses have been tried. It can rarely be advisable

to increase the dose above six minims (gr. $\frac{1}{2}$) except in persons habituated to indulgence in opiates. The salt used in this manner is at least three times as powerful for every therapeutic purpose as when swallowed, and meantime the majority of unpleasant symptoms which opiates are apt to produce are entirely obviated. The fact seems to be that in the gastric digestion of morphine much of the salt becomes decomposed, and its specific effect on the blood is lost; but during the digestive process it acts depressingly upon the gastric nerves, and disorders the functions of the stomach. In addition to this its effects are far more permanent, especially in the relief of nerve-pain; so much so, indeed, that the discovery of the hypodermic method has initiated quite a new era in the treatment of severe neuralgia. Dr. E. T. Wilson calls special attention to the three following points in the subcutaneous injection of morphine:—1. That the solvent should be distilled water, without any admixture of acid; 2. That the initial dose should be much smaller than that usually given; 3. That the injection should be performed slowly. With these precautions, he remarks, morphine may be introduced into the system safely and for indefinite periods, with but slight disturbance of the bodily functions. Perfect quiet subsequently to an injection should be strictly enjoined. Contraction of the pupil ensues in ten or fifteen minutes after the subcutaneous injection of morphine.

Morphine injection, like many other good things, is liable to abuse. Commenced first perhaps for the relief of pain, it continues to be used, not by authorized practitioners, but by the patients themselves, not for the simple allaying of pain, but to lull mental worries and anxieties, and to gratify a sensual craving; and thus resorted to daily, and perhaps several times daily, they become slaves to this pernicious habit. The alarming extent to which this morphine craving prevails in Germany is shown by Dr. Levinstein;[1] and although it may not be carried to anything like the same extent in England, yet it is to be feared that it is indulged in far more largely than is desirable. One such case is recorded by Dr. J. Braithwaite;[2] here a lady injected morphine daily for seven years, till the daily quantity reached fourteen grains *per diem!* Though the habit was eventually broken off, it was through much suffering. See also OPIUM.

Dose:—Of either of the Morphine Salts, gr. $\frac{1}{8}$–$\frac{1}{2}$, up to gr. j. internally, For hypodermic injection, gr. $\frac{1}{12}$–$\frac{1}{6}$ (see *ante*). *Of the Solution of the Acetate*, ♏x.–lx. *Of the Solution of the Hydrochlorate*, ♏x.–lx. The following preparations, introduced into the B. Ph. of 1885, claim notice:—*Liquor Morphinæ Bimeconatis* (Morphinæ Hydrochlor. gr. ix., Solution Ammon. q.s., Acid. Meconic. gr. vj., Spir. Rect. ʒss., Aq. Dest. q.s.); *the dose*, ♏v.–xl. *Tinct. Chloroformi et Morphinæ* (Chloroform. ʒj., Ether. ʒij., Spir. Rect. ʒj. Morph. Hydrochlor. gr. viii., Ac. Hydrocyan. Dil. ʒss., Ol. Menth. Pip. ♏iv., Ext. Glycyrrh. Liq. ʒj., Theriac. ʒj., Syrupi q.s.); dose, ♏v–x. *Morphinæ Sulphas;* dose, gr. $\frac{1}{8}$–$\frac{1}{2}$. *Of Morphine Lozenges and of Morphine and Ipecacuanha Lozenges*, 1 to 6. Each lozenge contains gr. $\frac{1}{30}$ of hydrochlorate of morphine, and the latter gr. $\frac{1}{12}$ of ipecacuanha. *Morphine Suppositories.* Each contains gr. $\frac{1}{2}$ of hydrochlorate of morphine. The power of morphine to intensify and prolong chloroform anæsthesia is noticed in art. CHLOROFORM (*q.v.*).

1468. *Therapeutic Uses. In Sciatica, Lumbago, Tic Douloureux,* and *other Neuralgic Affections,* no remedy promises more speedy and permanent benefit than morphine subcutaneously injected. Affections of this kind, observes Dr. Anstie, which under any of the older plans of treatment would at least have been very tedious, are sometimes cured after three or four injections of gr. $\frac{1}{6}$ each; and very many yield after a week or ten days of such injections repeated twice daily. Dr. H. Lawson has brought together in a

[1] Edin. Med. Journ. Aug. 1878. [2] Lancet, Dec. 21, 1878.

little brochure (London, 1872) a mass of conclusive evidence as to the efficacy of this treatment. The endermic application of morphine (gr. ss.–j.) sprinkled on a blistered surface over the seat of pain, is sometimes effectual, but is less certain in its operation than when injected hypodermically.

1469. *For the Relief of the Pains and After-pains of Labour* Dr. Kooman employs subcutaneous injections of the sulphate of morphine. Morphine as a parturifacient is made the subject of a suggestive paper by Mr. Wiglesworth.[1] Given internally in doses of gr. $\frac{1}{8}$–$\frac{1}{3}$, he speaks highly of its value in relaxing *Spasmodic Rigidity of the Os Uteri.* Cases of *Puerperal Convulsions* successfully treated by the hypodermic injection of morphine are recorded by Scawroni,[2] and Mr. Maberly-Smith of Melbourne.[3] The latter speaks very confidently of the efficacy of this treatment. He injected it in simple solution in doses of gr. $\frac{1}{4}$–$\frac{1}{3}$, according to the severity of the case. *Painful Uterine Affections* are often speedily relieved by the same treatment.

1470. *In the distressing Pruritus attendant on many Skin Diseases*, the subcutaneous injection of morphine merits a trial. Dr. H. Beigel relates a case of *Pruritus Senilis* cured by this means (gr. $\frac{1}{4}$). Great relief is often obtained from the application of the officinal solution, applied continuously to the part by means of a piece of lint soaked in it, in cases of *Painful Sprains, Bruises,* and *Gouty and Rheumatic Inflammations.*

1471. *In Spasmodic Asthma*, the hypodermic injection of morphine has been employed with marked benefit by Dr. K. Anderson,[4] Dr. McGregor Burns,[5] Dr. Berkart,[6] and others. One-sixth of a grain of the hydrochlorate generally suffices to afford speedy relief, which, however, is only temporary ; its action is palliative, not curative. Better and apparently more permanent results were obtained by Dr. G. Oliver[7] from a combination of acetate of morphine, gr. $\frac{1}{3}$, and of sulphate of atropine, gr. $\frac{1}{100}$. The after ill-effects, nausea, &c., which are apt to follow when morphine alone is employed, were thus obviated. See also next section.

1472. *In Diseases of the Heart*, Dr. Clifford Allbutt has employed morphine subcutaneously with marked advantage. He commences with gr. $\frac{1}{8}$ or $\frac{1}{6}$ of the hydrochlorate, and in ordinary cases increases it to gr. $\frac{1}{4}$ for an adult, to be injected in the evening, and followed by perfect quiet. The class of cases most benefited by this treatment he found to be *Dyspnœa* and *Angina with Diseased Coronary Arteries, Neuralgic Distress from Interthoracic Tumour,* and *Mitral Regurgitation.* It proved valuable also, in small doses, in so-called *Irritable Heart,* whether this were due to weakness of the heart or instability of its nerves. Dr. Moxon[8] testifies to the temporary relief obtained from the hypodermic injection of morphine in *Angina Pectoris arising from Cardiac*

[1] Obstet. Journ. Sept. 1877.
[2] Edin. Med. Journ. May 1860.
[3] Lancet, July 16. 1881.
[4] Practitioner, Nov. 1875.
[5] Practitioner, Feb. 1876.
[6] Brit. Med. Journ. June 1880.
[7] Practitioner, Feb. 1876.
[8] Lancet, April 30, 1881.

Disease; and Dr. E. Sansom[1] regards it, judiciously employed, as one of the most valuable adjuncts in the treatment of the distress, especially the *Dyspnœa and Insomnia attendant upon Failure of Compensation in cases of Mitral Regurgitation.* He found it valuable to combine the morphine (gr. $\frac{1}{3}$) with atropine ($\frac{1}{60}$) or digitaline (gr. $\frac{1}{50}$); but the morphine, he adds, is the essential agent in the successful treatment of mitral regurgitation where there is much respiratory distress. *In Aortic Disease,* where the heart is big and pumping, it gives much ease. In all these cases the urine should be examined, and the morphine withheld, or given with caution, if albumen be found. Dr. Allbutt, however, considers that there need be no great fear of it during *Albuminuria only secondary to Heart Disease,* unless there be reason to suppose that excessive renal congestion be present and head symptoms impending. In *Heart Disease,* associated with *Granular Kidney,* he thinks it should be avoided. As pointed out by Dr. Allbutt, there is a marked difference between morphine injections and opium, or morphine administered in the old way by the mouth: the safety of the latter in this class of cases is very doubtful.

1473. *In Hœmoptysis,* Dr. Braithwaite[2] states that for many years he has been in the habit of injecting morphine subcutaneously, and that its action is rapid, decided, and almost invariable. *For Paroxysmal Coughs,* Dr. Ringer (p. 557) advises the following: Morphine gr. $\frac{1}{40}$, Spt. of Chloroform ℿiij., Glycerine or diluted Honey ʒj. M. To be taken frequently when the cough is troublesome. Opiates in any form are inadmissible when with copious expectoration there is any indication of bronchial congestion.

1474. *In Chronic Deafness,* morphine is sometimes effectual. Dr. Hobecke relates a case in which all other remedies had failed; he then applied a small blister behind each ear, and on the denuded surface sprinkled gr. ss. of sulphate of morphine. On the following day the deafness on the left side had ceased, and all the other symptoms were much relieved. *In Inflammation of the Iris and Sclerotic,* Mr. J. Z. Lawrence found morphine produce a marked antiphlogistic effect. Its efficacy is further attested by Dr. Spender,[3] who commences with gr. $\frac{1}{12}$ every hour for the first twenty-four hours (omitting eight hours of the night), and gr. $\frac{1}{10}$ or gr. $\frac{1}{8}$ for the subsequent two days. A cure is often effected in four or five days. The diet should be restricted, and an occasional purgative given.

1475. *In Chronic Gastritis,* morphine is a valuable palliative, although generally inferior to hydrocyanic acid. Dr. Clifford Allbutt[4] obtained excellent effects from the subcutaneous injection of morphine (gr. $\frac{1}{4}$) in those forms of *Dyspepsia* characterized by irritability or erethism, or such as is often associated with hysteria, or which arises from great mental exertion or depression. *In Ileus, Violent Colic,* and *Spasmodic Affections of the Bowels,* the same treatment promises to be of great value. In these cases the endermic

[1] Med. Press, Feb. 7, 1883.
[2] Retrospect, lxvii. p. 17.
[3] Med. Chir. Rev. Jan. 1872.
[4] Practitioner, June 1869.

method, the spine being the site selected for the application, has occasionally been found effectual. Subcutaneously injected, it proved successful in allaying obstinate and alarming *Hiccough*, in the hands of Dr. J. Constable.[1] Three interesting cases of *Obstruction of the Bowels*, attended with obstinate vomiting, &c., cured by morphine injections subcutaneously, are recorded by Dr. J. Barclay, of Banff.[2]

1476. *In Laryngeal Phthisis*, when the cough is very troublesome, no treatment, according to Morell Mackenzie (p. 384), gives so much relief as the insufflation of morphine: gr. $\frac{1}{8}$ diluted with starch should be blown down twice a day, and as the disease advances the dose should be increased to gr. $\frac{1}{4}$ or $\frac{1}{2}$. Previous to its application the surface of the larynx should be cleared of mucus as far as possible, and the patient should endeavour not to cough for a few minutes afterwards. *In Diphtheria*, morphine or chloral is occasionally necessary to combat continued sleeplessness.

1477. *In Cholera*, Dr. J. Paterson,[3] during a severe epidemic at Constantinople, obtained excellent results from the subcutaneous injection of acetate of morphine. In ordinary cases one or two injections of from gr. $\frac{1}{4}$–j. sufficed. He does not set it forth as a specific, but only as yielding better results than any other treatment.

1478. *In Chordee*, one of the most effectual remedies is morphine in the dose of one-fifth of a grain injected subcutaneously at bedtime. (Mr. Berkeley Hill.)

For further therapeutic uses, see Opium.

1479. Morrhuæ Oleum. Cod-liver Oil.

Med. Prop. and Action. Valuable nutrient and alterative tonic. Taken into the stomach, if it be well borne—which from its disagreeable taste and smell it often is not, causing nausea, eructations—it induces increased appetite, ready assimilation of food, and an improved colour and character of the evacuations, the biliary secretions being often manifestly increased. The skin, from being dry, burning, or cold, becomes warm and perspirable, and the health and strength, after some perseverance in the remedy, gradually improve. Occasionally it acts as a diuretic. Most patients acquire *embonpoint*, with actual increase of weight, under its use. Its physiological action is thus explained by Dr. Farquharson (p. 275). It has been proved by experiment, he says, that animal oils are much more digestible than vegetable, and cod-liver oil is the most readily assimilated of all. After being emulsified by the pancreatic juice, it comes in contact with the bile, which distinctly increases its power of passing through moist animal membranes; and it is probable also that the biliary principles incorporated in its own structure aid in enabling it to be easily absorbed by the lacteals. Its action now is to improve the general constitutional tone, to evolve force and heat, and to aid in supplying those fatty elements which are so essentially requisite for the construction and repair of tissues. Various attempts have been made to explain the action of the oil by means of certain special ingredients which it contains (iodine, phosphorus, &c.), but none of these have been successful, and we cannot at present do more

[1] Lancet, Aug. 21, 1869.
[2] Med. Press, Dec. 29, 1869.
[3] Med. Times, Jan. 27, 1872.
[4] Lancet, April 29, 1871.

than attribute its restorative influences to its ready digestibility and nutritive properties.

Modes of disguising its taste. One great objection to the use of this oil is its nauseous taste. Various modes of disguising it may be tried. Thus, (1) it may be given on orange wine or on orange or lemon juice, or on a mixture containing T. Aurantii with a little nitric acid and syrup; (2) it may be given floating on porter or bitter ale, or on some aromatic water; (3) in emulsion, with confection of almonds and T. Cardam. Co.; (4) with the addition of a few drops of dilute nitric acid to the vehicle; (5) with hot milk or hot coffee; (6) in the form of pills. To form these, Des Champes directs 600 parts of the oil, 20 of water, and 80 of caustic soda. A mass is formed which, with tragacanth powder, can be made into pills.

The Dose varies according to circumstances. It is better to commence with one teaspoonful three times a day, and gradually to increase the dose to a tablespoonful, as the stomach becomes accustomed to it. The stools should be occasionally examined, and if found to contain any portion of the oil, it may be taken as an indication that it is being given in too large doses, which should be reduced accordingly. The best time to administer it is immediately after a meal. Patients who can take it at no other time will sometimes retain a dose if given the last thing before going to bed. Inunction with the oil is useful as a supplementary measure. For some useful hints on the administration of this remedy, see sect. 1481, Phthisis (*infra*).

Various substitutes have been proposed. Vegetable oils have been stated by Dr. Duncan and Mr. Nunn, of Colchester, to be nearly if not equally efficacious with cod-liver oil. Dr. T. Thompson, however, found that almond or olive oil did not enrich the blood in the same way as cod-liver oil. He thought that cocoa-nut oil bore a nearer resemblance to cod-liver oil in this respect. Dr. Bagot obtained excellent effects from other fish-oils. MM. Girardin and Pressier consider the oil of the liver of the skate preferable to that of the cod. Oils also from the livers of the shark and ray closely resemble cod-liver oil. Glycerine has also been proposed, but it proved a failure.

Ozonized Cod-liver Oil has been thought by some preferable to the ordinary oil, from the power it has been shown by Dr. E. S. Thompson to possess, of reducing the frequency of the pulse, an important point, especially in phthisis. This effect was not perceived when a less quantity than ʒij. twice daily was administered. It was more marked when this dose was doubled. The oleine of the cod-liver oil, instead of the simple oil, has been advocated by Dr. Leared, but it does not appear to have been generally adopted.

Etherized Cod-liver Oil. In order to render the oil more readily assimilated, Dr. B. Foster[1] advocates its exhibition in combination with ether. He uses three formulæ. No 1 consists of ♏x. of pure ether (B. Ph.) in ʒij. of the oil. Nos. 2 and 3 consist respectively of ♏xv. and ♏xx. in the same quantity of oil. The dose of this "Etherized Cod-liver Oil" to commence with is ʒij. In some cases the ether may be given in the same or larger doses in water before meals. This combination is based upon the experiments of Claude Bernard, which tend to show that ether has the power of augmenting the pancreatic secretion, which is so important an element in the assimilative process.

1480. *Therapeutic Uses. Scrofula.* In the scrofulous or tubercular diathesis, and its various manifestations, cod-liver oil is the remedy from which we may, as a general rule, anticipate the greatest amount of good. *Scrofulous Glandular Enlargements* are generally but little amenable to its action, and only yield very gradually as the constitution improves, under its continued use; but when suppuration ensues, and the resulting abscess is discharging, the operation of the oil is more manifest and speedy. Inunction with the oil daily to glandular enlargement has in some instances

[1] Brit. Med. Journ. Aug. 8 and 22, 1868.

seemed to aid its internal administration; but it may admit of a doubt if inunction of other substances—*e.g.*, iodine ointment—might not produce equally good, if not better effects. *In Scrofulous Diseases of the Skin*, it often produces the most salutary effects. Although not capable of itself of curing the local disease, it places the constitution in the best condition for receiving benefit from other specific remedies. It is a valuable adjunct to arsenic, &c. *In Scrofulous Affections of the Joints and Bones*, it is a remedy on which most reliance may be placed. Under its use, the discharge from *Scrofulous Abscesses* often speedily improves in character, diminishes in quantity, and finally disappears. It is also often of manifest service in *Scrofulous Ozœna and Otorrhœa* and *Scrofulous Ophthalmia*. In all these cases the remedy, to be effectual, requires to be persevered in, and a good hygienic system pursued.

1481. *In Phthisis*, no remedy is deserving of greater confidence than cod-liver oil; its efficacy is established beyond a doubt. The earlier in the disease it is had recourse to, the greater the chances of its success. Although it may admit of a question whether it is capable of *curing* the disease, it appears certain that under its use life may be considerably prolonged, and a greater amount of health enjoyed than under any other system of treatment. In the majority of cases there is a manifest, indeed often a remarkable increase of weight of the body under the use of the oil. Amelioration of the symptoms does not invariably accompany an increase of weight, though in the great majority of cases it does so; the exceptions are rare. On the other hand, a diminution of weight is almost invariably associated with an aggravation of the symptoms. The *modus operandi* of the oil in phthisis is obscure, but from the following table it is probable that it acts, in a great measure at any rate, by restoring a normal condition of the blood:—

	Blood in health. (Simon.)	Phthisis. (Simon.)	Phthisis. (Simon.)	Phthisis after taking Cod-liver Oil for a long period. (Simon.)
Water	791·000	807·500	825·200	750·000
Solids	208·000	192·500	174·800	250·000
Fibrine	2·011	4·600	6·500	a trace.
Globulin	112·346	71·230	61·110	94·500
Hæmatin		3·110	2·690	2·750
Albumen	75·590	98·360	90·350	131·000
Fatty matters	1·978	2·350	4·200	3·750
Extractives and Salts	14·174	9·350	8·000	15·250

In addition to the general directions given above, Dr. C. J. B. Williams[1] furnishes the following useful hints for its administration in this disease:—1. The best time for administering it is im-

[1] Lancet, July 4, and Aug. 15, 1868.

mediately after, or, to those who prefer it, at or before a solid meal. 2. In cases of peculiar weakness of stomach, with tendency to retching or vomiting, strychnine (gr. $\frac{1}{32}$—$\frac{1}{24}$) proves a most valuable adjunct. So does salicine. Neither of these, though a powerful tonic, has any of the heating properties of quinine or iron. If their bitter taste is objected to, they may be given in the form of pill after or before the oil. 3. It may be advantageously combined with a mineral acid. Nitric acid is best in inflammatory cases, and in those attended with much lithic deposit in the urine, but its tendency to injure the teeth is an objection to its long-continued use. Sulphuric acid is more eligible where there is liability to hæmoptysis, profuse sweats, or diarrhœa. But in most cases, for long continuance, diluted phosphoric acid is preferable to either. 4. The bulk of the whole dose of the oil and vehicle should be so small that it may be swallowed at a single draught; therefore the vehicle should not exceed a tablespoonful, with at first a teaspoonful of the oil, to be gradually increased to a tablespoonful. 5. The dose of the oil should rarely exceed a tablespoonful twice or thrice daily. Larger quantities either derange the stomach or liver, or some of it passes unabsorbed by the bowels. 6. The diet requires attention. With some persons the oil agrees so well, and so much improves their digestive powers, that they require few or no restrictions in diet; but this is not the case with the majority. The richness of the oil proves more or less a trial sooner or later to most persons; therefore it becomes proper to omit or reduce all other rich and greasy articles of food. All pastry, fat meat, rich stuffing, &c., should be avoided, and great moderation observed in the use of butter, cream, and very sweet things. Even new milk in any quantity is not generally well borne during a course of oil, and many find malt liquor too heavy, increasing the tendency to bilious attacks. A plain nutritious diet of bread, fresh meat, poultry, game, with a fair proportion of vegetables and a little fruit, and only a moderate quantity of liquid at the earlier meals, commonly agrees best. 7. Should a bilious attack come on, indicated by nausea, headache, furred tongue, offensive eructations, high-coloured urine, &c., it is necessary to suspend the oil, lighten the diet, and give blue pill or calomel, with an aperient on alternate nights, and an effervescing saline twice or thrice during the day. In a few days, when the attack has passed off, the oil may be resumed, beginning with small doses as at first. 8. In all cases during the use of the oil, the bowels should be kept regular in action, and if this cannot be done by regularity of habit and diet, it should be effected by the use of a mild daily pill of rhubarb or aloes. 9. According to Dr. Ringer, a little salt taken immediately before and after the oil often removes the taste, and prevents nausea. A few drops of ketchup, he adds, will also cover its taste. 10. The spoon and glass used for taking it should be kept scrupulously clean, as any oil left adhering to them soon turns rancid. (Dr. Sparks.)

1482. *In Tabes Mesenterica*, it has been employed with great

advantage. Under its use the patient rapidly gains strength and flesh, the appetite returns, the tumefied belly becomes reduced, and a perseverance in this remedy is followed by a mitigation or removal of all the symptoms; the stools lose their clayey colour, and become bilious and healthy. Dr. Bennett observes that in no disease, with the exception of rachitis, are the good effects of the oil so well established as in this. In these cases, indeed, it is often very striking in its operation, curing the disease when every other remedy has failed. It should not only be given internally, but used externally by inunction to the abdominal surface.

1483. *In Rachitis*, Dr. Bennett considers it the most efficacious of all remedies. M. Trousseau relates numerous cases in which it proved successful. He states that he generally found improvement at the end of eight or ten days, and that in the majority of instances a cure was effected in six weeks. He gave it in doses of ʒss.–ʒiij. daily, mixed with sugar or syrup. Dr. Hillier classes it with iron as the most useful drug in this disease.

1484. *In Chronic Hydrocephalus*, occurring in scrofulous children, improvement sometimes follows a course of the oil. If the child be thin, Dr. Hillier suggests that it should be given occasionally for a month or two, especially in cold weather, as an article of diet. The food at the same time should be of the most digestible and nutritious character.

1485. *Diseases of the Nervous System. Chorea*, especially when associated with cachexia, or occurring in scrofulous children, often manifestly improves under the use of cod-liver oil. Dr. Radcliffe reports very favourably of it. He generally gives it in conjunction with hypophosphite of soda (gr. v.–viij.), making the draught containing this salt the vehicle for the oil. With these, according to circumstances, he associates camphor or ammonia or both, adding the carbonate of ammonia to the draught containing the hypophosphite, and dissolving the camphor in the cod-liver oil. He finds this an excellent way of giving the camphor, which in its turn masks the taste of the oil not a little, and makes the stomach more tolerant of it. This treatment appears well worthy of further trial. *In Epilepsy*, Dr. Anstie employed cod-liver oil in twelve cases; of these, three were complete failures, three improved, and in the remaining six "the fits have entirely ceased, and, so far as can be seen, the disease has been cured." This is very encouraging. The remedy requires to be persevered in for a long time. It is well worthy of further trials in cachectic cases. Other cases of *Chorea*, *Paralysis Agitans*, and *Mercurial Tremors* treated with this oil are recorded by the same author; and he states that in all these cases, as well as in epilepsy, it has appeared to him more constantly useful than any other medicine.

1486. *Many forms of Neuralgia*, which resist quinine and other ordinary remedies, will sometimes yield to the plentiful ingestion of fat as an article of diet. Of these fatty remedies, cod-liver oil holds the highest rank; and when it does not immediately disagree with the stomach, it is, according to Dr. Anstie, the best fat to

employ. But in other cases, he remarks, butter, and especially cream, may be employed with great advantage. Even the vegetable olive oil, though far inferior to animal fats, may occasionally be used with good effect. It is necessary, in many cases, to make a series of trials before we arrive at the particular form of fatty food which is best suited to the particular patient. *In Gastralgia*, cod-liver oil will be required in the majority of cases, according to Dr. Clifford Allbutt.[1]

1487. *In Nervous or Sick Headaches*, especially in those occurring in persons engaged in pursuits requiring great mental strain, cod-liver oil often acts very beneficially, commencing with a teaspoonful once a day after breakfast, gradually increased to a tablespoonful (Dr. Latham).[2] *In Migraine*, Dr. Anstie[3] speaks of cod-liver oil as the best thing if it can be taken, but very often, he remarks, the patient will not or cannot bring himself to touch it at first, so we must begin with a little Devonshire or plain cream, and so get on by degrees to cod-liver-oil, when real improvement soon manifests itself.

1488. *In Syphilis and Syphilitic Affections*, cod-liver oil is often necessary for removing debility. In cases where neither mercury nor iodine can be borne, the patient will often regain power to take these after the use of the oil for a few weeks. (Hill and Cooper, p. 431.)

1489. *In Chronic Rheumatism*, the use of cod-liver oil, in this country, dates as far back as 1771, when it was introduced by Dr. Percival, and in those cases where it is associated with debility or cachexia, it is a remedy of considerable efficacy; but, as observed by Dr. Fuller, it is necessary, in order to obtain its full effects, to combine it with iodide of iron, quinine, or other remedies according to circumstances. Friction with the oil to the affected parts has been advised, but there is no satisfactory evidence of its possessing any special virtues over other oil used in the same manner. *Rheumatic Ophthalmia* sometimes improves under a course of the oil.

1490. *In Thrush*, especially when the child is weakly and cachectic, cod-liver oil (ʒss. thrice daily) is often of great service.

1491. *Laryngismus Stridulus*. Dr. Merei states that no remedy can bear comparison with cod-liver oil. To a child of from two to four months old he gives ʒj.–ij.; to one of six months, ʒiv.–vj. or more. If it cause diarrhœa, it may be combined with Dover's powder. When it disagrees, ℥ss.–j. should be rubbed daily on the spine. In the advanced stages of *Hooping-cough and other Spasmodic Coughs, supervening on Bronchitis*, especially when occurring in weakly children, great benefit often results from cod-liver oil.

1492. *In Anæmia*, from whatever cause arising, cod-liver oil is a valuable resource; it has already been shown that it exercises a marked influence in improving the blood. Its efficacy may be

[1] L. and M. Med. Surg. Reports, 1873, p. 111.
[2] Brit. Med. Journ. March 30, 1872.
[3] Practitioner, Dec. 1872.

further increased by combining it with iodide of iron or other ferruginous salt.

1493. *The Obstinate Constipation of Children* sometimes yields to the oil, and its return is prevented while the remedy is continued. (Dr. Ringer.)

1494. *In Stricture of the Rectum*, as an adjunct to dilatation, cod-liver oil is an excellent remedy; it nourishes the patient, and softens the motions, rendering aperients unnecessary. (Mr. Curling.)

1495. *In many Diseases of the Skin of a non-scrofulous origin, especially in Eczema, Lepra, Psoriasis, Ringworm, Pemphigus, &c.*, where the patient is cachectic and weakly, especially in the case of ill-fed children, cod-liver oil, conjoined with nutritious diet, often acts as a powerful auxiliary to local or other treatment. *Pruritus Pudendi and Eczema of the Vulva* are often relieved by smearing the parts with cod-liver oil (Dr. West). Dr. Rigby advocates combining it with equal parts of red precipitate ointment. Mr. Milton[1] remarks that there are only two remedies which have ever been shown to possess certain control over *Prurigo*—viz., cod-liver oil and arsenic, and he considers that these ought to have a fair trial in every case before it is pronounced incurable.

1496. *In Lupus*, Dr. Begbïe[2] speaks favourably of cod-liver oil as an adjunct to Chloride of Calcium (*q.v.*). Billroth states that in *Lupus*, the only internal remedy from which he has seen good results is cod-liver oil in doses of four to six tablespoonfuls daily; but, he adds, such a treatment must be continued for years.

1497. MUCUNA PRURIENS, D.C. (M. prurita, *Hooker.*)

A leguminous plant of the tropical portions of both hemispheres. The setæ or hairs from the outside of the pod (*vulgo* Cowhage) has long held a place as an anthelmintic. Its action is purely mechanical, and its use is limited to the *Round Worm*, or *Lumbrici*. The pods should first be dipped in honey or treacle, and then the setæ scraped off into it, until the mass has the consistence of an electuary. Of this the dose is one or more teaspoonfuls for three or four successive mornings, followed by a brisk purgative, when the worms are generally expelled. It is rarely employed in British practice, having been superseded by Santonin (*q.v.*).

1498. MUSCARINA. Muscarine. An alkaloid derived from Agaricus muscarius, Amanita muscaria, or Fly Agaric.

Med. Prop. and Action. Muscarine is an uncrystallizable strongly basic body, and is derived as above; it has been also prepared synthetically by Merck, of Darmstadt. It is used only in the form of a nitrate, a viscid brownish fluid, which does not deposit crystals. Muscarine is soluble in water, being indeed very hygroscopic. The extraction of the alkaloid is due to Schmiedeberg and Koppe, who also have supplied valuable particulars of its action. Letellier had some three years before Schmiedeberg prepared a body to which he gave the name Amanitine, but Schmiedeberg's work first elucidated the properties of the alkaloid.

Fly Agaric is used in Siberia and among the Kamtschatkades as an intoxi-

[1] Dis. of the Skin, p. 6.

[2] Edin. Med. Journ. July 1872.

cant. The practice is to work the fungus into a bolus, which is bolted, as, if chewed, it upsets the stomach. The effects are great exhilaration, laughter, and absolute loss of self-control.

Dr. Norman Chevers' case is well known, and it and others now extant, go to show that Fly Agaric produces very marked exhilarating effects upon the human subject. It is stated that the poison in passing through the body increases in power, so that the urine of a person only partially intoxicated with muscarine is capable of rendering other persons very drunk. Among the tribes addicted to Fly Agaric it is the practice to preserve and consume the urine when the fresh fungus is inaccessible.

The physiological action of muscarine has been thoroughly investigated by Schmiedeberg and Koppe, Prevost, Alison, Schiff, Ringer, Gaskell, Brunton, Murrell, and others. The two first-named observers found gr. $\frac{1}{15}$ produced myosis, with a loss of the power of focussing, salivation, determination of blood to the head, flushing of the face, profuse perspiration over the whole body. The head felt heavy, there was giddiness and feeling of anxiety, while griping pains were felt in the intestines, accompanied by rumbling. Ringer[1] used gr. $\frac{1}{3}$ hypodermically, and found the pupils become contracted; there was profuse perspiration, salivation, and the symptoms of coryza, with vesical tenesmus. In some cases, nausea, vomiting, and purging occurred. In all cases in which muscarine is pushed, whether in animals or man, marked and urgent dyspnœa appears as a most distressing symptom. This dyspnœa has been discovered by Lauder Brunton[2] to be due to a contraction of the pulmonary arteries. Muscarine has also marked influence over the function of the heart. Topically applied, Muscarine stops the heart in diastole, and it has been shown by Ringer and Murrell[3] that it exhibits a perfect antagonism to Atropine, Puturine, Duboisine, and Pilocarpine. When applied locally to the eye, dilatation of the pupil occurs, and so in this respect it resembles Gelseminum. Böhm has demonstrated that antagonism exists between Muscarine and Digitaline.

Muscarine lowers blood pressure; it also tends to tetanize the muscular layer of the alimentary tract. (Bartholow.)

There is marked influence exerted by muscarine upon the secretions, as is pointed out by most observers. Thus, the activity of the salivary glands and pancreas is enhanced, the liver[4] and mucous membrane of the intestinal canal have also their secretion increased. The kidneys, however, are functionally less active, for although there is frequent desire to micturate (Ringer and Morehead), less urine is actually passed. The skin and tear-glands have their activity promoted by muscarine to a notable degree.

For further details the reader is referred to Schmiedeberg's paper, "Das Muscarin," Leipsic, 1869; Dr. Bartholow and Dr. Ringer's Manuals; and a lucid paper by Dr. Murrell, "Practitioner," vol. xxv., and Dr. Gaskell, "Transact. of Intern. Med. Congress," 1881.

1499. *Therapeutic Uses. In Night-sweating of Phthisis,* Dr. Murrell employed a one per cent. solution of a liquid extract, and gave ℥v. in water three times a day. He found that it was convenient in some cases to give three doses at the interval of one hour before bedtime. The medicine is tasteless, and has the advantage that it does not dry the mouth.

1500. *In Constipation,* Dr. Bartholow suggests that when this is due to torpor of the muscular fibres of the intestines, Muscarine should, upon theoretical grounds, prove of service. He proposes the following formula:—℞ Muscarinæ, gr. iv., Extract

[1] Handbook of Therap., art. Muscarin.

[2] Brit. Med. Journ. Nov. 1874; Journal of Anatomy and Physiology, 1876.

[3] See Pract. vol. xxv., art. by Murrell, and Ringer's Handbook of Therapeutics, where details are given.

[4] Prevost, Bull. Gén. de Thérap. vol. xciii.

Belladonnæ, Ext. Nux Vom. āā gr. iij., Euonymin ʒss. M. Fiat pil. xij. One pill night and morning.

1501. *In Catarrh of the Duodenum and Catarrhal Jaundice*, the same authority proposes gr. $\frac{1}{8}$ every three hours. In those cases in which *Hæmorrhoids* are due to congestion of the portal vessels, muscarine promises to be of service.

1502. *In Inflammatory Effusions and Exudations*, Dr. Bartholow says "it promises well;" while he thinks it might be tried with advantage in common cold, acute bronchitis, hay asthma, &c.

1502*. *Pulmonary Hæmorrhage and Congestion* should be well treated by muscarine, since it lessens the calibre of the vessels, while it promotes secretion from the mucous surface. Dr. Bartholow, who has carefully indicated the lines on which we should expect to find muscarine serviceable in Therapeutics, proposes that it should be coupled with digitalis in the group of cases now under consideration. The digitalis will, while antagonizing muscarine's deleterious action upon the heart, assist muscarine in its behaviour towards the vessels. Dr. Bartholow further warns against the employment of muscarine in cases in which there is an excess of secretion from the bronchial mucous membrane.

1503. Mylabris Cichorii, *Fabr.* Telini Fly. A coleopterous insect, allied to Cantharis vesicatoria. Found in many parts of the East, and in the Indian Peninsula extending from Egypt to China.

Med. Prop. and Action. A powerful rubefacient and vesicant. As an external application it is a good substitute for cantharides, but contains a larger proportion of cantharidine, and is consequently more powerful in its action. If, however, it be used of a proper strength, it is perfectly safe, is speedy in its action, and renders the medical man in India independent of the European article, at least as an external application. For internal use it should not be substituted for the tincture of cantharides, as the strength and operation of the latter is well ascertained and uniform, which is not the case with the mylabris. Externally it may be applied in tincture (gr. clxxx., Proof Spirit Oij.), or in acetous solution (ʒij., Acetic Acid Oj.). The latter I have used in a great number of cases, with excellent effect; the fluid should be rubbed on the skin with a feather, and dressed with a light poultice, some simple cerate, or plantain leaves.

Therapeutic Uses. See Cantharis.

1504. Myristica. Nutmeg.

Med. Prop. and Action. Stimulant and carminative; in large doses producing occasionally great disturbance of the nervous system, characterized by vertigo, delirium, and stupor. Its activity resides principally in a volatile oil. Dr. H. Wood (p. 86) found this oil, injected into the jugular vein of the lower animals (?), produced profound narcosis with abolition of all reflexes, and finally death from paralysis of the respiratory centres. Mace, the lanceolate envelope of the nutmeg, also possesses, though in a minor degree, carminative properties.

Dose:—Of Nutmeg, gr. x.–xx. *Of the Volatile Oil*, ♏j.–v. *Of the Spirit of Nutmeg*, ♏xxx.–lx. *The Expressed Oil* is intended only for external use.

1505. *Therapeutic Uses. In Asthenic Diarrhœa*, proves a useful adjunct to other remedies.

1506. *In Flatulence and Flatulent Colic,* the volatile oil (gutt. ij.–v.) often affords speedy relief.

1507. *In Toothache,* a drop or two of the volatile oil introduced into the hollow of a carious tooth, gives immediate ease in some cases.

1508. *In Chronic Rheumatism, Paralysis, Sprains,* &c., the expressed oil of nutmegs, diluted with soap liniment, forms a very useful stimulating embrocation.

1509. Myrrha. Myrrh. A gum-resinous exudation from the stem of Balsamodendron Myrrha.

Med. Prop. and Action. Stimulant, stomachic, expectorant, and emmenagogue, in gr. x.–xx. Its physiological action, according to Dr. Delioux de Savignac,[1] who has recently examined its properties, is comparable on the one hand to the balsams, and on the other hand to the fœtid gum-resins. Its general stimulating properties are more active and its local action more lively than those of benzoin, storax, the balsams of Tolu and Peru, and almost equal to that of tar. Of its properties as a deobstruent and resolvent it is difficult to speak with confidence, as it has generally been given conjoined with purgatives, which would themselves play an important part in clearing the excretory passages and removing engorgements. It does not itself purge, but there is no evidence that it constipates, as the resins generally do. Its stomachic properties are more marked and decided than its emmenagogue or its expectorant, though in the latter character it may aid other remedies in calming the cough and facilitating expectoration. The tincture is a good adjunct to gargles.

1510. *Therapeutic Uses. In Amenorrhœa,* myrrh has long been held in high esteem. By itself, its power is very limited, but in combination with iron and aloes it appears to impart to those medicines an activity which they do not possess when given singly. Dr. Tilt speaks of the following so-called "Elixir of Paracelsus" as a very good emmenagogue: ℞ T. Myrrhæ f℥iv., T. Croci, T. Aloes āā f℥iij. M. Dose, f℥ij.–iij. twice daily in a little water. *In Chlorosis and Leucorrhœa,* it appears to exercise a beneficial influence. *In Vaginal and Uterine Catarrh,* Delioux de Savignac found myrrh particularly useful, especially in the form of vaginal injection:—℞ Tinct. vel Aceti Myrrhæ ʒiij., Aq. Oij. M. ft. injectio.

1511. *Painful Dyspepsia,* according to Delioux de Savignac (*op. cit.*), may be rapidly relieved or even cured by myrrh, either alone or combined with bismuth, &c. In those cases it relieves pain, awakens appetite, gives tone to the stomach, and renders digestion more active and regular. He strongly advises the following:—Myrrh, 20 grammes (gr. ccc.); rind of Seville oranges, 15 grammes (gr. ccxxv.); Malaga wine, Ojss.; macerate ten days, and filter.

1512. *In Bronchitis* of long standing, Dr. Williams states that he has found myrrh a very valuable medicine, particularly after a course of expectorants, when its grateful and tonic effects upon the stomach give it an additional recommendation. It is inadmissible when any fever or irritabillity is present.

1513. *In the Asthma of Old Persons,* myrrh is occasionally useful

[1] Bull. Gén. de Thérap. lxxxi. p. 481.

in arresting the exhaustion consequent on profuse expectoration. *In Hooping-cough*, the tincture (gutt. v.–xv. every 1 or 2 hours) has proved very successful in 53 cases by Dr. Campardon.[1] He gave it in cinchona wine.

1514. *In Sponginess of the Gums, Ulcerated Sore Throat, Ptyalism*, &c., a gargle or wash composed of ʒij.–iv. of the tincture in ℥iv. of water or infusion of cinchona, is highly serviceable.

1515. *To foul and indolent Ulcers*, also in *Caries* and *Necrosis*, the diluted tincture has been used as a stimulating wash.

1516. Narceina. Narceine. A neutral crystallizable body obtained from opium. It occurs in radiating tufts of fine silky acicular crystals, white, inodorous, and of a slightly bitter taste.

Med. Prop. and Action. Reputed hypnotic in doses of gr. j.–v. (gr. j. hypodermically), but the estimate of its powers by various observers, as Claude, Bernard, Harley, Weir Mitchell, Da Costa, Fronmüller, Oetinger, Eulenberg, Behir, is so diverse, and indeed opposed to each other, that it would be unadvisable to employ it in practice; but this, however, fortunately is of little consequence, for, as Harley (p. 150) points out, evidence is wanting to show that it possesses any advantage over morphine, and hence that it is practically useless as a medicine.

1517. Narcotina. Narcotine. Anarcotine. A neutral crystallizable body contained in opium, in proportion of from 1 to 8 per cent. It occurs in colourless flat prisms, inodorous, insipid, insoluble in water, soluble in rectified spirit, and more so in ether.

Med. Prop. and Action. Tonic and anti-periodic. When pure it is wholly devoid of narcotic action on man, but on the lower animals it acts as a convulsant.

Dose:—As a tonic, gr. ss.–j., thrice daily. *As an anti-periodic*, gr. ij.–iij.–v., in water, acidulated with hydrochloric or sulphuric acid, thrice daily.

1518. *Therapeutic Uses. In Intermittent Fevers* of India, narcotine has been extensively employed with very diverse results. Dr. Balfour[2] reported highly of its efficacy; and Dr. Garden[3] after testing it in 684 cases, states that there is no drug (quinine excepted) which cures intermittents so rapidly and so surely. Whereas, on the other hand, Dr. J. Cleghorn[4] reports that he found it in doses of gr. ij.–iij. thrice daily, quite useless in the intermittents of Lower Bengal; and that in those of the Punjab, though the dose thrice daily was raised to gr. vj.–viij., he never felt satisfied that it in the least arrested the fever or lowered the temperature in any case. It often appeared, he adds, to cause headache and complete loss of appetite; this has also been observed by others. As it is apt to cause constipation, an occasional purgative becomes necessary.

1519. *In Debility, especially in that produced by prolonged Lacta-*

[1] Glasgow Med. Journ. April 1, 1879.
[2] Ind. Ann. of Med. Sci. v. p. 547.
[3] Ind. Ann. of Med. Sci. vii. (1861), p. 400.
[4] Ibid. xiii (1869), p. 342.

tion, and in Convalescence from Febrile and Inflammatory Diseases, narcotine has been used with excellent effects in the East.

NICOTINE. See TABACI FOLIA.

1520. NITRIC ACID. Acidum Nitricum Dilutum. Diluted Nitric Acid.

Med. Prop. and Action. Strong nitric acid is a powerful caustic and escharotic, communicating a permanent yellow stain to the cuticle. The dilute acid, in doses of ♏x.–xx., is antalkaline, alterative-tonic, and refrigerant. If continued for a long period, it causes salivation; it has also apparently a more direct action on the liver than the other acids, but it disagrees with the stomach sooner than sulphuric acid. As a tonic, according to Dr. C. J. B. Williams, it is peculiarly adapted for *Convalescence after Inflammation,* and in *Cachexia following on Acute Disease, or on Habits of Intemperance.* It is an excellent alterative after long courses of mercury, renovating the strength, and improving the tone of the system in a remarkable manner. As it acts injuriously on the teeth, any medicine containing it should be sucked through a quill or glass tube, and the mouth should be rinsed out with an alkaline solution after each dose. Nitrous fumes, generated by the action of nitric acid (1 part) on nitrate of potash (1 part), possess some powers as a disinfectant, but it is thought to be inferior to chlorine. The nitrous acid fumes arising from the action of nitric acid (lb. iijss.) diluted with water (Oj.) on copper (lb. ¾) is more powerful than the preceding, but there is no evidence of its superiority to carbolic acid, which is safer and more manageable.

1521. *Therapeutic Uses. Calculous Disease. In the Alkaline and Phosphatic Diathesis,* nitric acid has been employed with advantage. The effect of these large doses in correcting the alkalinity of the urine is very remarkable. Sir Benjamin Brodie used to employ it as a direct solvent, by injecting into the bladder a mixture containing one drop of the strong acid in ℥j. of water. From numerous experiments he came to the conclusion that a calculus, composed externally of the phosphates, may be acted on by this injection so as to become gradually reduced in size, while it is still in the bladder of a living person. It is now rarely employed.

1522. *In Chronic Cystitis,* the employment of injections of a very weak solution of nitric acid was first proposed by Sir B. Brodie, and they are recommended by Sir H. Thompson. Dr. Braxton Hicks bears strong testimony to the value of weak acidulated injections in these cases. His treatment is as follows:—He washes out the bladder with warm water, slightly acidulated with a few drops of nitric, hydrochloric, or acetic acid to the ounce (a tablespoonful of vinegar to a pint of water answers very well). As much as the bladder can bear should be used; this is allowed to flow out again, and, if it can be borne, another similar quantity is injected and allowed to escape. After this, a solution of morphine (gr. j., Aq. ℥j.) slightly acidulated is thrown in and retained as long as possible, the longer the better. This should be repeated if possible twice a day. Sometimes when these fail, or where there is hæmorrhage, a solution of tannin (gr. ij., Aq. ℥j.) proves successful.

1523. *To Hæmorrhoids and Painful Hæmorrhoidal Tumours,* the application of strong nitric acid, first proposed by Dr. Houston,

of Dublin, is often attended with the best results. It is principally applicable to internal piles, and when the parts cannot be protruded it may be applied through a speculum. The great danger of its use is its extension beyond the point or points to which it is intended to apply it; for this and other reasons it is deemed by some inferior to the ligature. Dr. Ringer (p. 180) states that a lotion (Acid. Nitric. Dil. ʒj.–jss., Aq. Oss.) is an excellent application to bleeding piles, staying the hæmorrhage, constringing the swollen and inflamed tumour, and easing the pain.

1524. *To Syphilitic Warts and Vegetations*, when milder measures fail, nitric acid may be used as a caustic. The growths must be first dried, and the acid thoroughly applied, especially at its base, by means of a piece of wood small enough to pass between the eminences, so that the caustic may reach every part. The wart turns yellow at once, and if small, soon shrivels and falls off; but if the growth be extensive several applications will be necessary. (Hill and Copper, p. 590.)

1525. *In Chronic Hepatitis*, especially in old subjects, where mercurials have been largely used, a course of nitric acid and sarsaparilla or taraxacum is often productive of good. Nitro-hydrochloric acid fomentations may be employed at the same time. The same treatment proves beneficial in *Chronic Spleen Affections*. *In Waxy Liver*, Dr. Murchison (p. 33) states that in more than one instance he has met with marked improvement under the continued use of nitric acid conjoined with vegetable bitters—*e.g.*, gentian or quinine.

1526. *In Chronic Diarrhœa*, a combination of dilute nitric acid (♏x.–xv.) and laudanum (♏xv.–xx.) in a bitter vegetable infusion, proved very successful in the hands of Mr. Twining, of Calcutta. *In the Diarrhœa of Phthisis*, Dr. Barlow[1] recommends the following:—℞ Acid. Nit. Dil. ♏xij., T. Opii ♏v.–x., Syrup ʒj., Aq. Cinnam. ʒx. M. To be taken every four or six hours.

1527. *In Habitual Constipation*, Dr. Graves states that he has occasionally derived remarkable benefit from the use of nitric acid given in sufficient doses. He considers that it possesses the advantage of combining tonic with aperient qualities.

1528. *In Diabetes Insipidus*, Dr. H. Kennedy obtained striking benefit from dilute nitric acid, freely diluted (ʒj., Aq. Oj.). The doses in three cases were respectively 2, 4, and 5 drachms in the day. After a few days' persistence in the remedy he found the gums swollen and redder than natural, and though the state resembled salivation from mercury, he could detect no ulceration. In two of the cases this state was so marked and the suffering so great that he was obliged to suspend the use of the acid, and it is very remarkable, he adds, how rapidly the unpleasant effects then subsided.

1529. *In Uterine Disease* the claims of nitric acid as a caustic, and its superiority over other remedies of the same class, are ably

[1] Med.-Chir. Trans. vol. xi. p. 369. [2] Practitioner, Feb. 1878.

set forth by Dr. J. Braithwaite.[1] As an intra-uterine application, it was first used by Dr. Lombe Atthill [2] with advantage in cases of *Fungoid Granulations and Excessive Hæmorrhage;* it was introduced by means of lint bound on a uterine probe, through a small speculum placed in the cervix. Drs. Kidd and Roe, amongst others, have testified to its value and safety, but by many its use is regarded as dangerous. The question has been carefully examined by Dr. Playfair,[3] who concludes that in *Endometritis*, with profuse catarrhal discharge, nitric acid is in no way superior to milder and safer remedies; but that in cases of severe and otherwise intractable menorrhagia the evidence in its favour is too strong to be resisted, and he mentions having seen many cases of intractable menorrhagia completely and rapidly cured by a single application of the acid to the uterine cavity. It must not be forgotten, he adds, that there is a distinct risk of producing occlusion of the cervical canal. It need hardly be said that the intra-uterine application of nitric acid should only be undertaken by skilful and experienced hands. To check profuse discharge in *Cancer of the Uterus*, Dr. West (p. 405) advises a lotion of dilute nitric acid (℥j.) and water (Oj.)

1530. *In Puerperal Intestinal Irritation*, where diarrhœa is a prominent symptom, the latter may often be removed by a combination of nitric acid (♏x.) with a few drops of T. Opii.

1531. *Cardialgia or Heartburn*, which resists the use of the fixed alkalies, is often curable by dilute nitric acid, in doses of ♏v. every four hours.

1532. *In Hospital Gangrene and Phagedœnic Ulcerations*, the local application of strong nitric acid was first advised by Mr. Wellbank,[4] who gives the following directions for its use:—Having thoroughly cleansed and dried the ulcer, the surrounding parts should be covered with a thick layer of lard or ointment, to prevent the acid coming in contact with them. A pledget of lint, fastened to the end of a stick, is to be saturated with the acid, and to be carefully pressed on every part of the ulcer, till it is converted into a firm dry mass. After the first pain, which is generally severe, has subsided, the previous sufferings will be greatly relieved. Cold-water dressings are to be applied. The eschar generally separates in one or two days, and the sore should then be dressed with a common stimulating ointment or lotion. This, without doubt, is the best and most certain treatment of phagedænic ulceration. The constitutional treatment must be regulated according to the state of the patient. Mercury in every form should be avoided. *To sloughing and ill-conditioned Ulcers*, nitric acid largely diluted (♏l.–lx. ad Aq. Oj.) forms a useful lotion.

1533. *In Cancrum Oris*, strong nitric acid is the most effectual caustic in the worst forms of this disease. The constitution must at the same time be supported, and quinine administered.

1534. *In Lepra, Impetigo, and other obstinate Skin Diseases,*

[1] Obstet. Journ. Nov. 1875.
[2] Ibid. June 1873.
[3] Brit. Med. Journ. March 27, 1880.
[4] Med.-Chir. Trans. vol. xi. p. 369.

manifest benefit often follows a course of nitric acid in combination with sarsaparilla or hemidesmus. *In Urticaria*, ten drops of this acid in water, taken one hour before eating, is an almost unfailing remedy, according to Dr. Tyler.[1] *In Alopecia*, a serviceable liniment is made by adding to olive oil as much nitric acid as will render it pungent but not acrid. *Warts* are easily removed by cutting off the top and touching them daily with nitric acid, and removing from time to time the disorganized and hardened portion with the knife. (Sir E. Wilson.)

1535. *Nævus.* Prominent cutaneous nævi, when irregular in shape or ill-defined in their boundaries, are best attacked with nitric acid; the "anhydrous" or fuming acid, is the best for the purpose. It should be painted on with a glass rod in a thin layer until all appearance of vascular tissue has disappeared. The rod should never be so much saturated with acid that a drop could fall from it on the adjacent parts. Some carbonate of soda should be at hand in case of accident, and to apply to the nævus when the cauterization is complete. (Mr. T. Smith.[2]) This treatment is regarded by Mr. T. Holmes[3] as the best for superficial nævi. It should be carefully applied to the whole surface of the nævus, but not to the healthy skin around it, which should be protected by a layer of oil.

1536. Nitro-Hydrochloric Acid, Diluted. Acidum Nitro-hydrochloricum Dilutum. Diluted Nitro-muriatic Acid.

Med. Prop. and Action. Alterative-tonic and antalkaline; in doses of ♏v.–x. properly diluted. Externally it is used largely diluted as a bath or stimulating wash. (See sect. 1537.) As it is prejudicial to the teeth, the mouth should be washed out with an alkaline solution after each dose of the medicine.

Dose:—Of the Dilute Acid, ♏v.–xx.

1537. *Therapeutic Uses. In Chronic Hepatitis, in advanced stages of Acute Hepatitis, and Congestion of the Liver*, nitro-hydrochloric acid, both internally and externally, formerly held a high place in the opinion of the best tropical authorities, but as an internal remedy it has been superseded in a great measure by the chloride of ammonium (*q.v.*) With regard to the acid baths formerly so much in vogue, it may be stated, upon the authority of Sir J. Fayrer, that they are now rarely if ever employed. Too often have they been employed without any definite object and produced no definite result.

1538. *In Jaundice*, the acid was praised by Annesley, Scott, and others. Dr. Copland states that he has found it decidedly beneficial in some cases. It is inadmissible when inflammatory action is present. *In Dysentery*, especially when connected with hepatic disease, Sir J. Annesley directs lotions of this acid to be applied to the abdomen.

1539. *Oxaluria.* There is a morbid condition, probably dependent upon defective primary assimilation, in which the chief

[1] Ranking's Abstract, liv. p. 90.
[2] Lancet, 1867.
[3] Dublin Quart. Journ. Aug. 1869.

symptoms are general malaise, a feeling of weakness, great depression of spirits, &c., and in which crystals of the oxalate of lime are generally found in the urine; in this nitro-hydrochloric acid produces in a few days a surprising revolution (Dr. H. Wood, p. 105). Its value was first pointed out by Dr. Prout, who advised its continuance for three or four weeks, or until lithic acid or the lithates appeared in the urine. He found deposits of cystine in the urine disappear likewise under the use of this acid. *In Sciatica and other forms of Neuralgic Rheumatism, accompanied with Oxaluria*—by no means an uncommon combination—one of the most effectual remedies is nitro-hydrochloric acid in full doses (♏vj.–x.), aided by an occasional brisk purgative, the cold shower-bath, or a cold douche down the spine followed by friction, and change of air and scene where practicable.

1540. *In Chronic Bronchitis*, sponging the surface of the chest with the acid lotion is often of great service in checking profuse expectoration, and in otherwise mitigating the severity of the symptoms. *In Gangrene of the Lungs*, it may be advantageously given internally, combined with cinchona. *In Asthma*, the inhalation of the vapour of the dilute acid (f℥j., Aq. O$\frac{1}{4}$ at 150° F.) for a few minutes three or four times a day has been recommended, but Dr. Hyde Salter considers it should be used with great caution during a paroxysm.

1541. *In Acne Rosacea*, much benefit often results from the application of a lotion containing this acid, and also from the use of the acid foot-bath. *In Favus*, Sir E. Wilson advises its internal administration.

1542. Nitrogen, Protoxide of. Nitrous Oxide Gas. Laughing Gas.

Med. Prop. and Action. Excitant in small, anæsthetic in large doses. It has long been known by the name of *Laughing Gas*, from the fact that when inhaled in small quantities with a large proportion of air it produces a peculiar exhilaration, manifested, amongst other effects, occasionally, by laughter. Its applicability as an anæsthetic in surgery was first noticed by Sir J. Y. Simpson in 1847; but it was not till twenty years afterwards that it came into general use, and then only in those cases where speedy anæsthesia was required for short operations—*e.g.*, dentistry, to which its use has been principally limited. Amongst others who have advocated its employment is Mr. C. J. Fox,[1] who assigns the following reasons for its use:—1. Its safety. 2. The rapidity with which anæsthesia can be induced—viz., 50 to 100 seconds. 3. The readiness with which the patient can either be kept for a long period in the anæsthetic state, or, if necessary, can be promptly and thoroughly awakened. 4. Because it is actually pleasant to inhale, and therefore much fright and mental distress are avoided, diminishing the danger of death by syncope. 5. Because the recovery is usually bright, pleasant, and complete, any after-discomfort being very rare. 6. Because sickness has never to his knowledge occurred during its administration, and but rarely afterwards. Its advantages and disadvantages have been further pointed out by Mr. R. Rendle.[2] *Advantages.*—These are the rapid production of and recovery from anæsthesia, the absence of sickness, and the agreeable taste of the gas. That it is safe in all short operations there can be no doubt, and perhaps for longer ones, provided there is due admission of air at proper intervals; but great

[1] Lancet, April 2, 1870. [2] Brit. Med. Journ. Oct. 16, 1869.

care is required in its use, as is shown by the alarming symptoms which manifested themselves in some cases. *Disadvantages.* These are the time and trouble required in its preparation; its bulk and non-portability even when compressed into iron bottles; the complex apparatus necessary for its administration; and its unsuitability to certain cases, especially where muscular relaxation is required. The rigidity and congestion preclude its use for operations within the eye, where there is any increased tension. The muscular twitchings interfere with all delicate operations. Moreover, it has the objection common to all gaseous anæsthetics, as pointed out by Dr. Richardson—viz. that they remain gases at the temperature of the blood, and do not condense when introduced into it. Hence it is necessary to give it in very large quantities to produce anæsthesia, and this renders its use expensive. But notwithstanding all these disadvantages, some of which may yet be overcome, it is very useful in certain cases, especially dental. (Rendle.) One of these disadvantages—its bulk and its consequent non-portability—has been obviated in a degree by reducing the gas, by means of great pressure (750 lbs. to the square inch) to a liquid form.[1]

"The muscular twitchings," noticed above, constitute a great objection to its use, and yet they form one of the diagnostic marks of the patient being under the full influence of the anæsthetic. They not only interfere with delicate surgical operations, but they give to the countenance an appearance at once painful and alarming to the bystanders or the inexperienced. They, however, subside almost immediately on the free admission of air. Dr. C. Kidd,[2] who furnishes a graphic description of anæsthesia by the protoxide, points out its unsuitability for eye operations, in consequence of the rather dangerous bulging forward of the eye, caused by twitching of the muscles of the eyeball. He also mentions that the eye, under its use, rolls and protrudes in a curiously unsteady manner, which would render an operation dangerous.

Nitrous oxide gas will produce insensibility in one minute, but the effect is so transitory that it can be given only in operations (*e.g.*, dental) which can be completed in a few minutes. Its inhalation is best accomplished by means of Clover's combined inhaler, and in a minute's time, or after three stertorous inspirations have taken place, the patient will be found in a condition fit for operation. It produces great congestion of the vessels of the face and head generally, shown by the lividity of the countenance, and also occasionally causes bleeding from the nose, or even hæmoptysis. Clover's combined gas and ether inhaler (Mayer and Meltzer) has become a favourite apparatus for administering anæsthetics in several of the London hospitals; its mechanism being so constructed that it lies in the power of the administrator to give first nitrous acid gas alone, then a combination of gas and ether, and finally ether alone. Ether given in any open inhaler will not produce insensibility under eight minutes; given alone by a Clover's inhaler, it ensues in one to four minutes; and when preceded by a few inhalations of nitrous oxide gas, from two to three minutes.

1543. Nitroglycerine. Glonoin.

Med. Prop. and Action. Discovered in 1847 by Sobrero, it has received very thorough trial, and has obtained a wide and enthusiastic following. Liebe's method of preparation consists in pouring into ℥ij. of vitriol, ℥j. of dehydrated glycerine. The mixture is stirred during the addition. Then ℥j. of fuming nitric acid is poured in. It is necessary to keep the temperature below 77° F. by cooling the vessel. Oily drops soon form, and then the whole is poured into Ojss. of cold water, to allow the nitroglycerine to separate. It is then carefully purified, washed, and dried. The preparation of glonoin is fraught with great danger.

Nitroglycerine is an oily colourless fluid, sparingly soluble in water, but readily so in alcohol, ether, fats, and oils. It has a sweetish taste, is without

[1] See Brit. Med. Journ. May 14, 1870. [2] The Oxide of Nitrogen, &c.

smell, and crystallizes at a low temperature. Its vapour produces severe headache.

The physiological action of nitroglycerine is very marked in toxic doses. Although many have worked at this subject, yet it must be remembered that to Field of Brighton we owe one of the first accounts of the physiological action of glonoin. Respiration becomes quickened, the face slightly flushes, while an intense throbbing is felt in the arteries, "as if the head must burst in pieces." There is loss of reflex and total paralysis, death resulting from asphyxia. Sensation also becomes impaired. In man, besides the flushing, there is intense pallor and faintness, with vomiting and diarrhœa. The action of glonoin resembles that of nitrite of amyl, but while it quickens the heart's action, it does so less rapidly than the amyl compound, and the effect is more prolonged.

Several fatal cases have occurred. Murrell[1] gives as the best treatment, the recumbent posture, cold water affusion, Ext. Ergot. Liq. in 3j. doses, or Ergotin gr. j., Atropine gr. $\frac{1}{60}$ hypodermically. Stimulants are needed.

Modes of Administration and Doses. Glonoin may be prescribed either in the 1 in 200 solution in rectified spirit, or in the very convenient tablets, each of which contains gr. $\frac{1}{100}$, introduced into the B. Ph. in 1885. A pill (gr. $\frac{1}{100}$–$\frac{1}{50}$) in cocoa may also be used.[2]

1544. *Therapeutic Uses. Angina Pectoris.* Dr. Murrell,[3] arguing from the similarity of the action of nitroglycerine and nitrite of amyl, was induced to test the use of the former in angina pectoris. This he has done with excellent results. Dr. Ringer, speaking on this point, says he has often found nitroglycerine succeed when nitrite of amyl failed. A one per cent. solution is to be employed, or better, a half per cent., and one or two minims taken in water. So susceptible are some persons that even this dose produces severe almost intolerable headache, and intense discomfort. This dose may be given during the attack, but it is well to continue the use of it between the attacks, which are by this means warded off and robbed of their extreme severity. The dose may gradually be increased.

1545. *Migraine.* Among the many remedies advanced for migraine, nitroglycerine occupies a prominent place.

1546. *In Heart Disease,* Mr. Green, of Sandown,[4] considers it only second to digitalis. He places the complaints in such an order that those which are most benefited come first—angina pectoris, weak, fatty, and dilated heart.

1547. *In Cardiac Asthma,* nitroglycerine often proves highly valuable. It would appear in all these cases to act by dilating the arteries, lessening blood pressure in them, and so relieving the heart. Dr. Murrell, in the course of his researches upon the subject, made numerous sphygmographic tracings which showed dicrotism and marked lessening of arterial tension.

1548. *In Bright's Disease* and *Vascular Tension in the Aged,* Mr. May Robson[5] finds marked benefit accrue from nitroglycerine in the high tension pulse which occurs with cirrhotic kidney. His results have been abundantly confirmed. In some cases of *Uræmic Convulsions,* nitroglycerine has given prompt and marked relief.

[1] What to do in Cases of Poisoning, 162.
[2] Martindale's Extra Pharmacopœia.
[3] On Nitro-Glycerin in Angina Pectoris.
[4] Practitioner, Feb. 1882.
[5] Brit. Med. Journ. 1882, p. 803.

He has also used it in *Acute Nephritis*, obtaining favourable results. Mr. Robson says: "May it not be advisable, when one is called to a case of apoplexy, to at once give a dose of this potent remedy, and by lessening the pressure in the vessels, prevent further effusion." He believes he has seen apoplectic seizures obviated by adopting this course. Its use is also indicated in *Urœmic Asthma*.

1549. *Puerperal Convulsions.* Mr. Green, of Sandown, records cases of *Puerperal Convulsions* in which he employed nitroglycerine. From his other cases it would seem that in *Urœmic Convulsions* glonoin is of peculiar value, as it acts by inducing capillary dilatation, which is followed by lowering of arterial pressure.

Nux Vomica. See Strychnos Nux Vomica.

1550. Oleicum Acidum (B. Ph. 1885). Oleic Acid. The Oleates. Oleic Acid, introduced into the B. Ph. in 1885, is a fluid fatty acid obtained by saponification of olein. The only oleates made officinal are the Oleatum Hydrargyri and Oleatum Zinci, while from this last an ointment is prepared. The oleates are directed to be prepared by triturating the oxide of the metal in the oleic acid, a method (*v. infra*) which some authorities hold to be less useful than others.

Med. Prop. and Action. The credit for having placed the preparations of oleic acid and the oleates upon a sure basis in Therapeutics is due to Dr. Shoemaker of Philadelphia. The oleates have been used for many years, but those employed were impure, and limited of application. In 1872, Professor John Marshall brought oleate of mercury under the notice of the profession. It would appear, indeed, that subsequent researches and improvements owe their origin largely to the able and philosophic manner in which Professor Marshall indicated the value of using a normal, fatty excipient for inunction of therapeutic agents. In 1879–82, Dr. Shoemaker[1] drew attention to the fact that the so-called oleates were in fact merely solutions of alkaloids, metallic preparations, &c., in oleic acid. He also showed that the commonly used oleic acid was so impure as to be hardly oleic acid at all; that the acid in use also led to most deleterious results from the impurities it contained; that the pure oleic acid, as obtained by the methods in vogue, was too costly to admit of general therapeutic application. In a subsequent paper he showed that it was possible to make a pure sodium oleate, and by a process of double decomposition to form with this an oleate from any of the metals. Oleates so formed would bear the same relation to the older so-called oleates that true chemical compounds bear to mechanical mixtures. Dr. Squibb,[2] however, denies Dr. Shoemaker's accuracy, and affirms that the older oleates are indeed true chemical compounds, and that the method of double decomposition is not the best for the preparation of the oleates. It is impossible to enter into the discussion of these opposed views, but it is only fair to Dr. Shoemaker to mention that at the meeting of the Brit. Med. Assoc. at Belfast in 1883, he re-stated his contention, and essayed to prove it by a carefully elaborated address.

Physiological Action of the Oleates. The results arrived at by Dr. Shoemaker are negative. He found that after inunction with alkaloidal or metallic oleates no constitutional symptoms could be obtained, and that in no case were traces of the active principles employed found in the excretions or secretions of the animals upon which he experimented. He claims for the true oleates that they penetrate the epidermis, and enter the skin glands, and here their action

[1] Transac. Pennsylvania State Med. Soc. 1879 and 1882.

[2] See Ephemeris of Materia Medica, and Pharmaceut. Journ. Dec. 30, 1882.

terminates. In the mercury oleate he fancies some osmosis may occur, and so mercury enter the system. But even this is doubtful.

Mode of Preparation. The ointments of the oleates are thus prepared. The fatty base is melted at a low temperature in a water bath. This, however, does not apply to the silver oleate.

The preparations made with petroleum are less serviceable than those manufactured from lard.

To increase the pliability of the ointment, Dr. Shoemaker suggests the addition of oleic acid.

Modes of Application. The oleates should, Dr. Shoemaker assures us, be used as ointments. He animadverts upon the inexpediency of attempting to alter their natural physical condition. An exception may be stated in favour of the zinc and silver oleates, which are most serviceable when used in the pulverulent state, and applied to ulcerated surfaces. As the action of oleates must vary largely with the active principle involved, it is proposed to give in brief the conclusions at which Dr. Shoemaker has arrived concerning the various applications.

1551. *Therapeutic Uses.* These will be best considered under the headings of the individual oleates, as they depend largely, if not solely, upon the metal with which the oleate is combined.

1552. OLEATUM ALUMINII. Oleate of Aluminium.

Med. Prop. and Action. Prepared by decomposing sodium oleate with aluminium sulphate. The washed precipitate mixed with equal parts of lard forms the ointment: thus prepared, it is semi-solid, dark brown in colour, and has a most powerful astringent action.

1553. *Therapeutic Uses.* It quickly checks all *Muco-purulent Discharges*, and is a useful dressing for *Foul Ulcers, Sinuses, Burns, and Scalds.* It checks *Hyperidrosis*, and antiseptises the sweat, thus forming a useful application to axillæ, groins, &c., of children. The *Bromidrosis* from the feet is cured by using this oleate.

1554. OLEATUM ARSENICI. Oleate of Arsenic.

Med. Prop. and Action. Preparation. The precipitate obtained by the decomposition of a solution of the chloride of arsenic by oleate of sodium. In proportion of gr. xx. to ʒj. of fatty base, it forms a soft yellowish ointment, having no action on the skin. When applied to *Wounds* or *Ulcers*, it destroys the tissues to some depth.

1555. *Therapeutic Uses. In Lupus*, especially the ulcerating forms, its constant application will destroy cell-infiltration in a mild and comparatively painless manner. It is also used with advantage in the *Tubercular form of Lupus* and in the ulcerating variety of *Epithelioma.* It may be employed, after scraping the surface, to destroy *Warts, Condylomata, Corns*, and *Old Granulations.* It may be combined with opium, belladonna, arnica, &c. (Dr. Shoemaker.[1])

1556. *Seborrhœa, Sycosis*, and *Chronic Eczema* are benefited by it.

1557. OLEATUM ARGENTI. Oleate of Silver.

Med. Prop. and Action. Preparation. Is obtained by decomposing a saturated solution of nitrate of silver by the sodium oleate. The precipitate is washed with boiling water, dried, and reduced to a fine powder. Of this ʒj. to ʒj. of fatty base forms a most useful ointment.

[1] Lond. Med. Record, Nov. 15 1882.

1558. *Therapeutic Uses.* The oleate in powder, sprinkled over *Old Chronic Ulcers*, *Bed-sores*, and *Exuberant Granulations*, will set up healthy action. It is a safe and efficacious remedy in *Erysipelas*, either applied round the margins to prevent the inflammation from spreading, or in a dilute form to the inflamed surface. It checks *Pruritus of the Anus* and of other parts, and is sometimes used combined with opium, belladonna, &c. (Dr. Shoemaker.[1])

1559. Oleatum Bismuthi. Oleate of Bismuth.

Preparation.—Is prepared by decomposing a glycerole of crystallized nitrate of bismuth by a solution of the sodium oleate. It contains about 22 per cent. of the oxide of bismuth. It has a pearly-grey colour, soft and bland, and of the consistence of ointment. It has an emollient and slightly astringent action, and is most valuable in soothing and relieving cutaneous irritation.

1560. *Therapeutic Uses.* *In Pustular Eruptions*, particularly in *Sycosis*, the oleate, lightly pencilled over the surface, affords peculiar relief. It is likewise very efficacious in *Erysipelas* and *Sunburn*. It is most useful in *Gonorrhœa* and *Gleet*, introduced into the urethra smeared on a bougie, and allowed to remain in the passage some minutes. (Dr. Shoemaker.[1])

1561. Oleatum Cupri. Oleate of Copper.

Med. Prop. and Action. This should be mixed with 4 to 9 parts of lard (=20 or 10 per cent. of the oleate). It acts as a stimulant and astringent when in contact with the broken skin. It also penetrates deeply into the follicles which it stimulates.

1562. *Therapeutic Uses.* *In Hæmorrhage from Ulcers*, &c. By dint of its astringent powers it is enabled to stay bleeding from *Irritable Ulcers* and *Sores; Obstinate Granulations* yield to its action.

1563. *Tinea Tonsurans* and *Tinea Versicolor (Chromophytosis)* are easily controlled by copper oleate. During the treatment it is necessary to abstain from applying water to the part. Epilation is not needful.

1564. *Warts*, *Corns*, *Bunions*, *Thickened States of the Epidermis* are benefited.

1565. *Freckles* have no more effective treatment than oleate of copper. (Shoemaker.)

1566. Oleatum Ferri. Oleate of Iron.

Med. Prop. and Action. The oleate has been successfully applied as a styptic and astringent.

1567. *Therapeutic Uses.* *In the Inflammatory Stage of Eczema*, for *Pustular Eczema*, *Furunculosis*, *Sycosis*, *Scrofulous Ulcers*, and *Sinuses*, this oleate is serviceable. It is also useful in the first and second stages of *Acne Rosacea*, and in the *Cutaneous Lesions* following *Poisoning by Arsenic*.

[1] Lond. Med. Record, Nov. 15, 1882.

OLEATUM HYDRARGYRI. Oleate of Mercury. See HYDRARGYRI OLEATUM.

1568. OLEATUM PLUMBI. Oleate of Lead.

Med. Prop. and Action. It is melted with equal parts of lard or lard-oil, according to the season, and gives a cream-coloured semi-solid ointment, superior to Hebra's litharge ointment (Shoemaker). It is mainly of service as an emollient and in easing the intolerable itching of papular eczema.

1569. OLEATUM STANNI. Oleate of Tin.

Med. Prop. and Action. This oleate enjoys a reputation in the treatment of diseases affecting the nails.

1570. *Therapeutic Uses. Brittle, Cracking Nails*, and that troublesome affection *Persistent Agnails*, it is said, yield to tin oleate. Carmine gives this oleate a tint which is of service in the cosmetic *Treatment of the Nails.*

1571. OLEATUM ZINCI. Oleate of Zinc.

Med. Prop. and Uses. Resembles powdered French chalk.

1572. *Therapeutic Uses.* It is useful in *Hyperidrosis, Osmidrosis*, and *Bromidrosis; Excessive* and *Offensive Sweating* upon slight exertion, or none at all, which affects the axillæ and groins of some persons, yields rapidly to zinc oleate. *Night Sweating of Phthisis* (Murrell) and *Local Sweating* are controlled. Dr. Murrell uses it as a dusting powder.

1573. *In Vesicular Eczema*, when the surface is hot, swollen, inflamed, and raw, and when there is intense itching, oleate of zinc proves of immense service. Dr. McCall Anderson also finds it of value in *Eczema of the Nares.*

1574. The *Shining of the Face* which troubles some ladies is completely removed by oleate of zinc inunctions.

1575. VARIOUS OLEATES OF THE ALKALOIDS are prepared. They appear to possess but little power or utility. Dr. Shoemaker, who has made a careful study of the subject, has arrived at the conclusion that they fail when the action of the alkaloid is required to be obtained.

1576. OLIVÆ OLEUM. Olive Oil.

Med. Prop. and Action. Emollient; slightly laxative in doses of f℥j.–ij. It is composed of about 72 per cent. of oleine and 28 of margarine. In medicine it is principally used as an emollient ingredient in enemas, and as a mechanical antidote in cases of poisoning, enveloping the poisonous particles, and protecting the gastric mucous surface from their action. The value of inunction of the whole body with warm olive oil in the treatment of infantile diseases has been set forth by Dr. H. G. Knaggs,[1] the process being repeated every 12, 6, or 4 hours, according to the urgency of the case. He mentions having successfully employed this treatment in *Atrophy, Bronchitis, Diarrhœa, Febrile Dis-*

[1] Lancet, Jan. 22, 1870.

turbance, and indeed in all *Disorders of Childhood* which are accompanied by an unnatural state of the skin. He considers that it has all the advantages of a warm bath without its disadvantages. The great value of oil inunction in the *Diseases of Scrofulous and delicate Children*, specially as a preventive of *Croup*, is set forth by Dr. Moir,[1] who also quotes the testimony of Sir J. Y. Simpson in its favour. There can be no doubt that in many cases it proves very serviceable by nourishing and strengthening the system in delicate children, especially in *Marasmus*, *Tabes Mesenterica*, *Rachitis*, &c., when produced by mal-assimilation and combined with a dry and disordered state of the skin. A wineglassful of slightly warmed oil is directed to be applied every night at bedtime over the whole body for ten or fifteen minutes, or until the process of absorption is complete. The treatment requires to be kept up for two or three weeks. *As a Preventive of the Plague*, olive oil has long enjoyed a high repute, but the facts adduced as to the immunity of oil dealers during epidemics, though very curious, are far from conclusive as to proving its prophylactic power. Olive oil enters into the composition of a large number of liniments, cerates, and ointments. With alkaline bases it forms soaps.

1577. *Therapeutic Uses.* *In Pruritus Pudendi*, a little olive oil, spread over the parts with a feather, often affords relief when other remedies have failed. *In Pruritus Scroti, seu Ani*, it is also very efficacious. *In the Pruritus and Burning Pain attendant on many Skin Diseases*, the continuous application of olive oil by means of rags kept moistened with it, not only affords present relief, but seems in some instances to promote the curative process, partly, perhaps, by excluding the action of the air, and partly by its emollient properties. *For the Irritation which accompanies the presence of Ascarides in the Rectum*, an enema containing f℥ij.–f℥iij. of olive oil often affords immediate relief.

1578. *In Ophthalmia Tarsi and Granular Disease of the Eyelids*, a great amount of relief, sometimes permanent, will follow the introduction of a drop of olive oil into the eye. *Many forms of Ophthalmia*, attended with much irritation, are benefited by this application; and it often manifestly allays the *Pain caused by Stimulant Collyria of Nitrate of Silver*, &c.

1579. *In Stricture of the Urethra*, the following hint of Sir H. Thompson's[2] is worth remembering:—"When you have a very narrow stricture to deal with, instead of oiling the instrument, it is as well to throw ℥ss. or ℥j. of olive oil into the urethra, holding the syringe well round the meatus. It is easy to insinuate this quantity of oil through a very narrow stricture. It lubricates the parts, and sometimes the urethra is distended with the oil, so that if you can cleverly retain it with the finger and thumb, you may introduce the instrument when you have been unable to do so in any other way. It does not do well when there is much bleeding, or the tissues are torn, but when it is not so, the plan is sometimes useful."

1580. Opium. Opium.

Med. Prop. and Action. These are epitomized by Dr. Farquharson (p. 186), whose remarks, slightly abridged, are here adopted. *On the Nervous System.*—In small or medicinal doses "Opium is gently exciting to the brain, the intellectual faculties becoming generally stimulated, and the imagination more

[1] Edin. Med. Journ. March 1879. [2] Lancet, 1868.

vivid. To this, however, rapidly succeeds a dulling or deadening effect, drowsiness supervenes, and deep sleep finally sets in, from which the patient wakes within a period proportioned to the quantity of the drug administered. Headache, dryness of the mouth, and digestive disturbance are frequently experienced. It is not quite clear in what precise way the narcotizing influence is produced, but analogy would lead us to believe that contraction of the cerebral vessels imitates natural sleep by inducing an anæmic condition of the grey matter of the brain. The resulting contraction of the pupil is probably central in its origin, as it cannot be produced by any local application of opium in any form. The conductivity and irritability of the sensory nerves are much diminished, so that pain is felt with less intensity. 2. *Vascular System.*—The action of the heart is at first slightly quickened, but afterwards its beats become slower, the pulse fuller and firmer, and the arterial tension is raised, the effect being considered due to an influence on the cardiac inhibitory nerves. It is noticed, however, that shortly before death in opium poisoning the pulse becomes feeble, rapid, and irregular. 3. *Respiration and Temperature.*—The breathing tends to become slow, from the paralyzing influence of opium on the respiratory centre, and at the same time the secretion from the bronchial tubes is lessened. The temperature at first rises a little, but finally falls when sweating is established. 4. *Digestive and Secreting Organs.*—Nausea occasionally follows the use of opium, and constipation invariably results from diminution of the intestinal secretions, no less than from arrest of the peristaltic movement of the canal. The salivary secretion is also diminished, causing dryness of the tongue. The urine is lessened, but opinions differ as to the effect produced on its solid ingredients. The biliary secretion is checked. The secretion of the skin is increased, perspiration usually resulting; and we may say generally that opium checks all secretions but that of the skin. Elimination takes place by the breath, sweat, urine, &c.

Toxic Effects. In poisonous doses, the resulting sleep gradually grows deeper, the breathing becomes heavy and stertorous, the face is flushed, swollen, and dusky, the pupils contracted to mere points, distension of the right side of the heart still further prevents the return of blood from the engorged lungs, and paralysis of the respiratory centre finally causes death by suffocation. Much difficulty may occasionally attend the diagnosis of opium poisoning from (1) alcoholic coma, where, however, the pupils are usually dilated; (2) from uræmic coma, where an examination of the urine, if practicable, might clear up our doubts; and (3) from apoplectic effusion in the pons Varolii, where the symptoms are usually so similar as to render an absolute diagnosis under certain circumstances impossible. (Farquharson.)

The post-mortem appearances in poisoning by opium are neither constant nor well-marked. Turgescence of the vessels of the brain, with or without serous effusion into the ventricles, and at the base, and very rarely accompanied by extravasation of blood, forms the most marked morbid appearance. Lividity of the skin, congestion of the lungs, a fluid state of the blood, and early putrefaction of the body, are among the less constant appearances. (Guy.)

The shortest period within which opium or its preparations have proved fatal is three hours; few cases are prolonged twenty-four hours; the average may be stated at from seven to twelve hours. When a patient survives *twelve* hours, there is good hope of his recovery.

The smallest dose which has proved fatal is four grains in an adult, and two drops of laudanum in an infant. Enormous quantities have been taken by adults with impunity. In one instance recovery took place after no less than eight ounces of solid opium!

Treatment of Opium Poisoning. Empty the stomach as speedily as possible by the stomach-pump if one be at hand, if not by emetics (Zinci Sulph. 3j., or a tablespoonful of mustard in warm water); if the patient cannot swallow, these may be given *per rectum*. In extreme cases might not speedy emesis be induced by the subcutaneous injection of apomorphine? (*q.v.*) Rouse the

patient, prevent sleep by all means, keep walking him about, apply cold douche to head, dash cold water on face and chest, flagellate the extremities with a wet towel, apply galvanism, and as a last resource, artificial respiration. Hot, strong, black coffee (*café noir*) or strong tea may be given *ad lib.*; it is far preferable to alcoholic stimulants, which often seem to intensify the toxic effects. If the patient can swallow, give animal charcoal freely. (See CARBO ANIMALIS.) These measures should be persevered in, bearing in mind that as long as life lasts hope of recovery is not to be abandoned. In the majority of cases persevering treatment proves successful. The question of atropine as a physiological antidote to opium is considered below.

Treatment of the habit of Opium-eating. This has been made the subject of an interesting paper by Dr. A. Fleming,[1] of which the following is a brief abstract:—It is of the greatest importance that the habit should be suddenly and completely suspended; this is infinitely more efficient and easier to the patient than the gradual diminution of the dose. To carry it out requires much moral courage, both on the part of the practitioner and the patient. At first there is generally an increase in the mental as well as the bodily suffering of the patient; he is a prey to intense depression, sleepless, excessively irritable, full of alarms as to his condition, and will (unless he be a man of unusual strength of mind) pitifully implore to be allowed an opiate to relieve his distress, declaring, if refused, that his life is in danger. The existence of any danger, however, as far as Dr. Fleming's experience goes, is an illusion. At the same time, the patient suffers much from pains in various parts of his body, but especially in the stomach and bowels, the pulse rises in frequency—sometimes as high as 120—the tongue is coated with white fur; there is an increasing thirst, and total loss of appetite; the bowels, which were formerly confined, are now much relaxed, and diarrhœa supervenes; the skin softens, and finally sweat pours out from the surface. There is also marked diuresis and frequent micturition. In severe cases these symptoms may endure for a week, but ordinarily for about three or four days; they disappear gradually, and the patient becomes conscious of a grateful sense of returning health and peace of mind such as he has not known since he became an opium-eater.

Having interdicted the opium, and taken the necessary precautions against the patient procuring it surreptitiously, Dr. Fleming prescribes the following:—℞ Acid. Phosph. Dil. ʒx., Tinct. Lupulinæ (D.) ad ʒxxx. M. Of this fʒij. are taken in a large wineglassful of water every four hours, one hour before food. This helps to sustain the patient, lessens the force of his suffering, and shortens its duration. All the strong bitter tonics act in the same way, but none so efficiently as the above. The dose may be either increased or lessened according to circumstances. If wakefulness be very protracted, the following draught may be given at bedtime:—℞ Tinct. Cannabis ♏xxx.–lx., Spt. Ætheris ʒj., Aq. ad ʒj. M. With regard to diet, milk and beef tea alternately, every four hours, may be allowed at first, and gradually, as the appetite improves, chickens, chops, &c., until the stomach can accept the ordinary diet. If there should be any manifest signs of faintness, a little port wine or brandy should be given every four hours, one hour before the medicine; but in ordinary cases there is no need whatever for alcoholic stimulants, and their use is injurious, by keeping up irritation of the stomach, and delaying the recovery of appetite. The surface of the body should be frequently sponged with water, slightly acidulated with nitro-hydrochloric acid, and the clothing changed so as to keep the surface dry. During convalescence, a tonic regimen, good food, pure air, a daily bath, cheerful occupation, and genial society, are requisite. As blood tonics, zinc and iron, given for a month at least, are valuable. ℞ Zinci Valerian. gr. ij., Quininæ Sulph. gr. j., Ext. Lupuli q.s. To make one pill. To be taken morning and evening, every second day. ℞ Syrup. Ferri Phosph. ʒxiv., Acid. Phosph. Dil. ad ʒxx. M. ft. mist. One drachm in a wineglassful of water to be taken immediately after dinner and supper every second day. Dr. Fleming is convinced that more advantage is obtained from this plan of

[1] Brit. Med. Journ. Feb. 15, 1868, p. 137.

giving iron and zinc on alternate days, than if the zinc were given first and the iron subsequently, for a fortnight or more continuously.

Opium Smoking, a practice originating in China, has gained a strong hold amongst the lower orders and the debased of most Eastern nations; and in Great Britain also, according to Dr. Scoresby-Jackson (p. 331), the practice of opium-smoking, in one form or other, is carried to a deplorable extent. Sir W. O'Shaughnessy[1] gives the following graphic description of those examples so constantly met with in Calcutta:—"Stupor, reverie, and voluptuous listlessness are the immediate effects produced. In this state the patient can be at once and easily aroused to exertion or business. No sickness, or constipation, or any other functional disturbance, supervenes on each indulgence; gradually, however, the appetite diminishes, the bowels become irregular, emaciation takes place, sexual tendencies are destroyed, and premature old age comes on." "This," he continues, "is an extreme case; when the habit is but moderately followed, it appears to occasion no greater evil than a proportionate indulgence in wine or other spirituous liquors." Very diversified opinions have been expressed as to the ill effects of opium-smoking: that they have been greatly exaggerated by some there can be little doubt, but to maintain, as others have done, that it is a perfectly innocuous practice, no more injurious than blowing soap bubbles, I hold to be an utter fallacy. It would be no more philosophically correct to say arsenic-eating is an innocuous practice, because the Styrian peasants practise it, than it is to say opium-smoking is harmless because the Rajpooti indulges in it without detriment. It is a most insinuating practice, and once begun will be continued in increasing quantities, till it becomes an all-absorbing passion, and brings on premature decay of mind and body. It appears to affect certain nations more than others, the Burmese and Bengalees bearing it badly compared with the Chinese. Opium-smoking has been said not to shorten the term of life, but good statistics are yet wanting to support the assertion. Alibert[2] considers that the use of opium renders the body less susceptible to the influence of miasmatic and other morbific actions.

Opium-smoking as a Remedial Agent has been proposed by Dr. Reginald Thompson.[3] He used it in the form of cigarettes made of nitre-paper. From numerous trials he concludes that $\frac{1}{64}$th grain of the extract of opium is sufficient for an initial dose, and in this quantity, smoked at bedtime, it was found notably to allay *Cough, and procure sleep in many cases of Phthisis and Asthma*. The cigarettes were smoked in the ordinary way, but if the full effect of the dose be desired, the smoker should be instructed to expand the lungs with full inspiration, and retain the smoke in the lungs.

Remarks on the use of Opium. 1. Some people are peculiarly susceptible to the action of opium, and are unable to take even the smallest dose without its occasioning delirium, a high state of nervous irritability, vomiting, diarrhœa, &c. Where this idiosyncrasy exists, opium should not be given, unless some more than ordinary circumstances demand it.

2. Infants and young children bear the exhibition of opium badly. Numerous are the instances on record in which two or three drops of laudanum have produced fatal results in young children; and opium in every form should be avoided, unless it is imperatively called for, and should never be given without the greatest caution. It should be laid down as a rule, that when it is necessary to prescribe opiates for children, those preparations whose strength is regulated by a certain standard should be preferred to those whose strength is variable and uncertain. Thus, Dover's powder is preferable to syrup of poppies, the strength of which is very variable. As opium is eliminated by the milk, it should not be given to mothers whilst suckling their children, or it may dangerously affect the latter.

3. Persons unaccustomed to opium require a much smaller quantity of the drug, to produce a certain effect, than those who are habituated to its use.

[1] Bengal Dispensatory, p. 180.
[2] Elémens de Thérap. t. xi. p. 76.
[3] Practitioner, April 1879.

4. Combination with other drugs greatly modifies the action of opium; ipecacuanha increases its action on the skin; mercurials obviate its constipating influence; and tartar emetic lessens the action which it would otherwise excite in the nervous system. Bromide of potassium is said by Dr. Da Costa to mitigate or prevent the unpleasant effects of opium.

5. When a large dose of opium has been administered, and the patient is still suffering intense pain, how long should we wait before it would be considered safe to repeat it? This question, put by Dr. Griffin,[1] is answered by him, that half an hour is the limit within which crude opium will be found to manifest its effects; and that the dose may be safely repeated, if the pain or spasm be not relieved, however often it may be given. The liquid preparations of opium act rather sooner than the solid drug.

6. When opium is given for the relief of a pain, particularly of a periodical character, a third part of the dose which was required to relieve the paroxysm is required to prevent its recurrence. In fact, a moderate dose given in the interval will sometimes prevent the accession of the fit, when no quantity, however great, can control it after it has once set in.

7. When opium or opiates have been given for any length of time, or in large doses, a period of exhaustion and sinking almost invariably ensues, from twelve to twenty-four hours after the drug has been discontinued. A great amount of exhaustion and sinking has been observed to follow the omission of even a very reduced dose, particularly in children. A little nourishment, or some slight stimulant, is here necessary.

8. An over-dose of opium will produce effects very similar to those of an under-dose. Where a restless night has resulted from an over-dose having been given, sound sleep may occur next night without any opium whatever. Again, if the doses of opium, given with advantage during the existence of inflammation, be continued when this has subsided, stupor or troubled sleep, according to the degree of surplus opium given, will result.

9. In order to procure sleep, opium should be given an hour or two before the usual hour of retiring to rest, in order to allow the stage of excitement to pass off previous to that time.

10. When, from irritability of the stomach, or from some other cause, opium cannot be administered by mouth, its full physiological effects may be speedily induced by the subcutaneous injection of morphine (*q.v.*). It may also be administered in the form of enema; a larger dose, a third or half larger, is required when it is exhibited in the latter mode. It may also prove of great service when applied externally, in allaying pain, irritation, and inordinate action, not only of the skin, but of the subjacent tissues.

11. As a diaphoretic, opium is best combined with ipecacuanha. The cutaneous and the mammary secretions are the only ones not sensibly decreased by opium; the former it increases.

Antagonism between Opium and Belladonna has been asserted to exist by Anderson, Bell, and others, and several cases in which they have mutually been employed as antidotes are on record. The subject has been carefully examined by Dr. Harley, who (p. 309) draws the following conclusions:—1. That the evidence of antagonism, in any given case, is inconclusive. 2. That, taken individually or collectively, the cases (of which he furnishes a full table) show that belladonna has no influence whatever in accelerating the recovery from the poisonous effects of opium. 3. That somnolency, stupor, narcotism, and coma—the essential effects of the action of opium—are both intensified and prolonged by the concurrent action of belladonna. 4. That belladonna is powerless to obviate the chief danger of opium-poisoning—*i.e.*, depression of the respiratory function. 5. That the results of the combined action of opium and belladonna are the same, whether given in medicinal or toxic doses. While, therefore, belladonna cannot in any sense be regarded as an antidote against opium, but in large doses the exact reverse, it may, when the heart

[1] Medical Problems, art. x., from which this and the three following remarks are drawn.

shows indication of failing power, be used in conjunction with other remedies, and always in very small doses, as a means of aiding recovery. From an investigation on animals, Dr. J. Hughes Bennett[1] draws the following conclusions:—1. That sulphate of atropine is, within a limited range, physiologically antagonistic to meconate of morphine. 2. That meconate of morphine does not act antidotally after a large dose of atropine; thus, whilst atropine is an antidote to morphine, morphine is not an antidote to atropine. And 3. That meconate of morphine does not antagonize the effect of atropine on the branches of the vagi supplying the heart.

An antagonism between Opium and Quinine was first pointed out by Dr. Gubler. Dr. Nivison, who has examined the subject, maintains that this antagonism is only partial, influencing or modifying only the bad effects of these agents, enabling us to prescribe them simultaneously with advantage when they could not otherwise be given.

Opium is either contra-indicated or should be given with caution in the following states:—1. In cerebral affections occurring in persons of a plethoric habit, and where congestion of the vessels of the brain is suspected. 2. In acute sthenic inflammation in plethoric subjects, previous to the employment of depletion. 3. In pulmonary affections, when the cough is dry and hard, and the expectoration is difficult and scanty. 4. In affections of mucous membranes of the air-passages, attended with copious secretion. In such conditions the narcotizing influence of opium, by diminishing the respiratory function, has often proved fatal. 5. In morbid states of the body, where venous congestion is evident. 6. Whilst the urine is scanty and high-coloured. Alkalies should, in such a case, be generally administered first; but if the symptoms be urgent, and opium is imperatively called for, it should be given in combination with alkalies. It acts prejudicially in Bright's disease. 7. During pregnancy. Dr. Denman states that he is persuaded that the frequent use of opiates by pregnant women is prejudicial to the fœtus. Testimony to the same effect is adduced by the late Dr. Adams, of Banchory, who considers, on good grounds, that the administration of opiates to pregnant women ought to be proscribed. 8. In fevers and other morbid states, accompanied by contraction of the pupils. 9. In most functional derangements of the liver, particularly when there is evidence of lithæmia. (Murchison.) 10. The contra-indications of opium are all comprised in the existence of hyperæmia. So long as the pulse is small, soft, and compressible, opium is rarely contra-indicated; but when the pulse becomes full, and especially full and hard, opium is almost always hurtful. (Pécholier.[2])

The Constituents of Opium. There is perhaps no single drug in the Materia Medica which contains so many principles of so diversified a character as opium, hence its complex action on the system. First in order and most important are its somniferous or hypnotic principles, *Morphine*, *Codeine*, *Narceine*, and *Meconine* or *Opianyle*. These are placed in the order of their potency; the hypnotic power of the two latter being greatly impaired, and their value consequently lessened, by their comparative insolubility. *Cryptopine* is another somniferous principle, according to Dr. Harley (p. 168) twice as active as narceine and meconine, and one-fourth as powerful as morphine. It exercises, however, a peculiar influence in causing dilatation of the pupil when administered in large doses. Standing opposed to these principles is another, *Thebaine* or *Paramorphine*, a powerful stimulant, which acts exclusively on the motor-nervous centres, inducing in them that highest degree of excitement which results in tetanic spasm or cramp, proving fatal to life by arresting the respiratory movements. We have next *Apomorphine*, which in quarter-grain doses acts as a speedy and energetic emetic; and then *Chlorocodide*, possessed of a bitterness equal to that of strychnine, and which promises to be of value as a tonic and anti-periodic: in this respect it approaches to the salts of another opium constituent, *Narcotine*, more properly designated *Anarcotine*, which,

[1] Brit. Med. Journ. 1874, p. 547. [2] Lond. Med. Record, July 15, 1880.

according to some good authorities, is little inferior to quinine in controlling periodical or malarial fevers. Further notices of these principles will be found under their respective headings.

Dose:—Of Opium, gr. ss.–ij. *Of the Extract*, gr. ss.–ij. *Of the Liquid Extract*, ♏x.–xl. *Of the Tincture, Laudanum* ♏v.–xl.; contains opium gr. j. in ♏xv. nearly. *Of the Ammoniated Tincture*, ♏xxx.–lx.; contains opium gr. v. in fʒj. nearly. *Of the Wine, Vinum Opii*, ♏x.–xl.; contains Ext. of Opium gr. xxij. in fʒj. nearly. *Of the Compound Powder*, gr. ij.–v.; contains opium gr. j. in gr. x. *Of the Confection*, gr. v.–xx.; contains opium gr. j. in gr. xl. *Of Opium Lozenges*, 1 to 6; each contains gr. $\frac{1}{10}$ of Extract of Opium. *Enema of Opium*, Preparation for external use only. *Liniment of Opium. Opium Plaster.*

1581. *Therapeutic Uses. In Inflammation*, the powers of opium, in properly selected cases, are often very marked. That opium is more applicable and beneficial in some inflammations than in others is universally admitted, and Sir T. Watson has endeavoured to draw the line of distinction in these cases, which in the main holds good, although his views require some modification, in consequence of the facts elicited by recent investigations as to the powers of opium in the shape of morphine when subcutaneously injected; it being evident from these that many of the ill effects of the crude drug, when swallowed, arise from its decomposition in the process of gastric digestion. He also cautions against the use of opium when there is any tendency to coma or apnœa accompanying the inflammation. He adds: On the other hand, it is, *cœteris paribus*, in cases where the tendency is towards death by asthenia, that the use of opium, as a remedy for inflammation, is most serviceable; thus it has a capital effect often, after depletory measures, in cases of peritonitis and of enteritis.

1582. *In Typhus Fever*, opium, though not to be trusted to alone as a curative agent, fulfils many important indications, and, judiciously employed, is capable of effecting much good. On this point Dr. Buchanan observes:—"The headache, sleeplessness, and delirium are frequently lessened, even though there be a good deal of suffusion of the eyes, by opium." He states that he constantly gives ♏v. of the tincture every four hours, or else a night-dose of ♏xv., with considerable advantage to these symptoms; but he avoids opium when the pupils are very small, when there is coma, or when there are any serious lung complications; with these exceptions he considers there are no contra-indications to the use of this drug. If opium be given with the object of soothing delirium, he advises that it should be given in full doses at night, and not in small and frequent doses; under the above circumstances he thinks, if possible, it is better to avoid opium. Combined with a small quantity of tartar emetic, opium has an increased power of relieving headache and of inducing sleep. Two prominent points in this passage—(*a*) the avoidance of opium when contraction of the pupil is present; and (*b*) the advantage of a combination of opium and antimony—were first pointed out by Professor Graves, of Dublin, in 1838, and his observations have in a remarkable degree been confirmed by the subsequent experience of others. He gave 3 or 4 drops of laudanum with gr. $\frac{1}{6}$–$\frac{1}{8}$ of

tartar emetic in solution every two hours, till it produced tranquillity and sleep. In boisterous delirium he increased the dose of tartar emetic. To this Dr. Ringer (p. 563) adds:—"Nowadays morphine, hypodermically administered, is found to act more certainly and speedily, without deranging the stomach or intestines." When there is muttering delirium with muscular tremors and great prostration, laudanum, Dr. Ringer (*op. cit.*) observes, may be given alone with the most signal benefit. He directs ℥lx. (or morphine gr. j.) to be mixed with ʒiv. of water, and of this a teaspoonful to be given every five or ten minutes till three or four doses have been administered. If by that time the patient be not asleep, the medicine should be discontinued for half an hour; and if there be still no sleep, a few more doses may be given. By this method, he adds, calm, refreshing, and invigorating sleep can frequently be produced, which may last for several hours, and the patient wakes refreshed and free from wandering, while the appetite and digestion are considerably strengthened, and the skin is made comfortably moist. Sometimes, however, he adds, it answers better to give a single moderate dose. With this mode of treatment patients progress favourably with less alcoholic stimulant than would otherwise be required. Brandy or wine, if indicated, may be freely given with the laudanum.

1583. *In Typhoid Fever*, opium under the circumstances mentioned in the last section is often serviceable, but there are special conditions in this form of fever in which its use is indicated: thus, severe abdominal pain is often best relieved by an occasional full dose of opium. *In Intestinal Hæmorrhage*, it forms an excellent adjunct to acetate of lead and other styptics, especially in the form of enema, thus:—℞ Plumbi Acet. gr. x., Acid. Acet. Dil. ℥x., Morphinæ Acet. gr. ss., Aq. Tepid. ʒiv. M. ft. enema. *In Diarrhœa*, it may advantageously be combined with sulphuric acid (℞ Acid. Sulph. Dil. ℥xxx., T. Opii ℥x., Decoct. Cinchonæ fʒjss. A draught to be taken every four hours), or with sulphate of copper and other styptic salts. Opiate enemas (℞ T. Opii ℥xv.–xxx., Mucilag. Amyli fʒiv.) are of great value in allaying that irritability of the lower bowel which often induces purging. When enemas cannot be retained, we may still use suppositories—*e.g.*, Pil. Sapon. Co. gr. v.–x. (Dr. Harley.) *In the Tympanitis of Typhus or Typhoid Fever*, arising suddenly and independently of peritonitis or perforation, Dr. Broadbent[1] obtained excellent results from T. Opii ʒj. in enema, repeated if necessary. Under its use the tympanitis was dissipated in a few hours, with a corresponding improvement in the general condition of the patient. *The Sleeplessness* in the earlier and also in the later stages of *Typhoid* has been treated by opiates, a practice condemned by Sir W. Jenner.[2] Experience, he remarks, has convinced him that although in some cases opium in sufficient doses to secure sleep has afforded relief, it is on the whole a most dangerous remedy. In the early stage of fever it disturbs digestion and checks secretion; in the later stages

[1] Practitioner, Feb. 1877. [2] Lancet, Nov. 15, 1880.

he states he has seen several cases fatal from its influence on the brain, heart, and secreting organs. The hoped-for and occasionally attained good is in his opinion altogether outweighed by the possible evil and occasionally fatal effects resulting from the administration of direct sedatives. (Opium, &c., in the later stages of fever, see CHLORAL.)

1584. *In Intermittents*, Dr. Lind warmly advocated a full dose of opium half an hour after the commencement of the hot stage, as affording present relief and mitigating the course of the disease. Others have advocated its use at the commencement of the cold stage, and some trials which I made with it convinced me that a full dose (ℳxl.) given on the first appearance of the cold stage, often had the effect of cutting it short almost like a charm; and although it did not seem to shorten the subsequent hot stage, it appeared in many instances to mitigate its severity. Any antiperiodic power possessed by opium is probably due to the narcotine it contains.

1585. *In Hay Fever*, Mr. White Cooper speaks highly of the tincture of opium in doses of gutt. ij.–iij. every two hours for three times, followed by one drop every two hours until the discharge from the eye and nose diminishes. This treatment should be continued at longer intervals for three or four days.

1586. *In Small-pox*, in the early stage, when patients are restless and sleepless, anodynes often fail to procure rest; but it may be worth while to try them once to see the effect, and repeat the dose or not as may be judged right. In the wakefulness of the advanced stage of the disease, in patients who are otherwise doing well, an anodyne given once or twice, just to get them into the habit of sleeping, answers admirably, and nothing does so well as hydrochlorate of morphine (gr. iv., Aq. ℥j.; dose, ℳxx.–xxx.). Neither this nor any other anodyne should be given when there is copious salivation and mucous expectoration, as during sleep these are apt to collect in the air-passages, and the patient may die asphyxiated.

1587. *For Insomnia*, opium is a remedy of established value, but it is not equally effectual in all cases. It is specially adapted for those cases where the sleeplessness is due to severe pain, and here opium, by allaying the pain, makes sleep possible. Dr. Sleightholme [1] found this to be the case with morphine hypodermically injected. When sleep was dependent upon or was accompanied by great excitement or delirium, as in mania, delirium tremens, &c., the injections not only frequently failed to procure sleep, but were often followed by increased excitement.

1588. *Diseases of the Brain and Nervous System. In Insanity*, opium, if given judiciously, is a remedy of great value, but much discrimination in its use is necessary. Dr. Maudsley [2] has furnished us with some valuable remarks on the subject. It is, according to his experience, most beneficial in the incipient stages of insanity, at that early period of mental depression which so

[1] Practitioner, July 1871.

[2] Practitioner, Jan. 1869.

often precedes actual derangement of thought; here opium (gr. j.), combined with extract of aloes (gr. ij.), every night at bedtime, and tonics with a moderate allowance of stimulants during the day, almost immediately dispel all troubles. In other cases, morphine, gr. $\frac{1}{4}$–$\frac{1}{2}$ thrice daily, is most suitable, and should be persevered with, notwithstanding an apparent want of success at first. In confirmed *Melancholia*, when the patient is incapacitated from all healthy exertion, and his mental suffering is so great that he asserts he cannot bear it, and dreads that he may do some injury to himself —when paroxysms of acute anguish and despair come on at times, and he hardly knows what he does—the systematic use of opium proves most useful. Even in the more distressing cases, where there is persistent suicidal impulse, opium is of value, though not so much so as in the former cases. When given in these cases it should be in sufficient doses, beginning with at least gr. j. twice or thrice daily. *In Melancholia connected with Suppressed Menstruation*, great benefit sometimes follows a combination of opium, aloes, and strychnine; but in that dependent on "change of life" in women, *Climacteric Melancholia*, it seems to do no good. Neither does it produce benefit in acute frenzical melancholia, nor in chronic melancholia with a settled delusion, nor in that form where the patient appears like one utterly demented, but where the mind is really absorbed in one great and terrific delusion. Here purgatives appear to offer a better prospect of success. As opium agrees better with persons of a melancholic than with those of sanguine temperament, so it appears on the whole to be more useful in melancholia than in maniacal forms of insanity. This is true in the main, still there are cases of acute mania in which it acts beneficially; where, for instance, there is no heat or congestion of the head, but where the face is pale, the pulse weak, and where a restless activity and incoherence are accompanied by want of sleep. The cases in which opium is either useless or hurtful are—(1) sthenic mania; (2) mania dependent upon organic disease of the brain, and in that occurring in the course of general paralysis; (3) hysterical mania, epileptic mania, and that connected with sexual or uterine excitement. In the two first classes, digitalis or henbane, and in the third, especially in the epileptic variety, bromide of potassium, offer better prospects of success than opium in any form. Dr. Maudsley's valuable paper will well repay careful perusal.

1589. *In Puerperal Mania*, opiates, formerly much relied upon, are apt to do more harm than good; so speaks one of our best modern obstetrical authorities, Dr. Playfair (ii. p. 299), and he cites the opinion of Dr. Blandford to the effect that opium never does good and may do great harm. *In Puerperal Melancholia*, however, especially in the non-chronic forms, opiates in moderate doses, not pushed to excess, may be given with great advantage. They are best administered by subcutaneous injection. (Playfair.)

1590. *In Delirium Tremens*, opium was formerly regarded as the sheet-anchor, and when judiciously employed, under special conditions, it is doubtless a remedy of great value; but its indis-

criminate use in heroic doses is now well-nigh abandoned. Dr. Wilks regards large and frequently repeated doses of opium as highly dangerous. Camphor in these cases is said to prove an excellent adjunct to opium. It is of the utmost importance for patients labouring under this disease to have a full animalized diet, and as the stomach is unable to digest solid food, strong broth or beef-tea, milk, &c., should be taken as often and as largely as possible. Anything which will interfere with the assimilative process is objectionable, and it is probable that opium, by its depressing influence on the visceral nerves, may in this manner prove highly prejudicial. This is one of the ill effects of opium overlooked by most of the older writers on this disease. To obtain the full effect of the drug, without deranging the digestive organs, it would be far preferable to employ morphine hypodermically. Dr. Anstie is of opinion that in this disease we ought never to give opiates by mouth when subcutaneous injection of morphine is possible. As a hypnotic in this disease it is in a great measure superseded by chloral (*q.v.*).

1591. *In Tetanus*, opium has been given in enormous quantities, with the view of overcoming the spasmodic paroxysms; but repeated experience has proved it inoperative, and with physostigma, aconite, cannabis indica, and chloroform at hand, it would be waste of time (if not worse) to resort to opium. *In Hydrophobia*, it has also been used in large doses, but without effect, even in mitigating the symptoms.

1592. *In Sciatica, Tic Douloureux, and other Neuralgic Affections*, opium, internally administered and locally applied, is occasionally of great service, but both these modes are far inferior to morphine introduced hypodermically; when thus used, its effects are often speedy and permanent. (See MORPHINE.) In the words of Dr. Anstie, the discovery of the hypodermic method has initiated quite a new era in the treatment of severe neuralgias. Dr. Fuller recommends the following application, especially in *Sciatica*:— ℞ T. Opii, Sp. Æther. Sulph. Co., Glycerini, āā ʒiij., Ext. Belladon. gr. xx. M. A strip of flannel soaked in this should be applied along the course of the nerve, and then covered with oiled silk to prevent evaporation. Speedy relief soon follows in some cases. *The deep-seated Pain in Herpes Zoster* is greatly relieved by opiate applications such as the above.

1593. *Diseases of the Chest. In Phthisis*, in the advanced stages, opium proves a valuable palliative. By its judicious use we may in a measure relieve the cough, lessen the amount of expectoration, check the diarrhœa, and afford a great degree of sensible comfort. It may be given by mouth or in the form of enema, and in such doses as the patient can bear without producing deep sleep or any inconvenience. It is a valuable resource, often available when other expedients fail.

1594. *In Pneumonia*, Dr. Watson regards opium as very desirable, often relieving pain, allaying the distressing cough, and procuring sleep. He adds that the pain in the side which so frequently

accompanies pneumonia, and for which depletion was formerly prescribed, may generally be relieved by a dose of opium. The same remark holds good with respect to *Acute Pleurisy*. Opium is likewise of great value as a means of arresting *the Delirium which is apt to supervene in Pneumonia*. On the first appearance of the indications of approaching delirium—*e.g.*, want of sleep, restlessness, slight staring of the eyes, and slight tremor of the hands—a few doses of opium, and the exhibition of stimulants and nourishment, may at once arrest the attack. At the same time, avoid all depletory measures; rather make it your object to improve the nutrition of the brain and give vigour to the circulation, and as you accomplish these results you will find that the delirium will disappear. (Dr. Waters, p. 71.)

1595. *In Asthma*, opium is of doubtful value. On this point Dr. Hyde Salter wisely observes: "Prefer any other sedative to opium; and unless there is some special complication that indicates it, never give it at all." The complication which calls for its use is bronchitis, where the asthmatic tendency is kept up by the irritation of the inflamed bronchial membrane; here it often acts very beneficially, just as it allays *Bronchitic Cough*, in which it is often of signal service. In these latter cases, however, opium may prove dangerous if there is much accumulation in the bronchi, as it is apt to deaden the sensibility of the bronchial membrane to such an extent as to prevent its expulsion, and the bronchi may consequently remain clogged for want of expulsive cough, and fatal results may ensue. *Bronchitic* and other *Chronic Coughs* are often much benefited by an opiate plaster to the chest.

1596. *In Pleurodynia*, Dr. Graves has seen great benefit from directing the part to be well steeped, and then rubbed with warm laudanum. This will often procure immediate relief.

1597. *In Hooping-cough*, opium has long been prescribed with the view of allaying spasmodic action. This is best effected by morphine, which has been successfully employed by Dr. Müller, of Berlin, and others. Dr. E. Smith (i. p. 282) especially advocates this treatment, which consists essentially in causing the slightest oppression of the sensorium, as a measure of the required effect of the drug, and maintaining this from three to six days, till the spasm yields wholly or in part. With children under one year of age, the dose of the hydrochlorate or acetate of morphine should be gr. $\frac{1}{64}$ repeated every four hours; between one and three years, gr. $\frac{1}{48}$–$\frac{1}{32}$; for those yet older, gr. $\frac{1}{32}$–$\frac{1}{20}$. The dose selected should be repeated three or four times, and if no perceptible drowsiness be induced, it should be increased a step, and repeated in like manner; and again increased, if necessary, until the dose has been found which produces the slightest oppression of the sensorium. The aim must then be to maintain this effect by repeating the same dose, or by further increasing it from time to time. The cases of simple hooping-cough, he remarks, are extremely few, in which *slight* drowsiness has been produced and uniformly maintained for three or four days without the spasms having subsided, and the

cough being nearly reduced to that of a common cold. It is rarely necessary to add any other remedy; but in some cases carbonate of soda has tended to lessen the irritability of the larynx, and promote expectoration.

1598. *In Influenza*, opium is best avoided in the early stages, but at a later stage, when the expectoration is coughed up easily, and all danger of lung congestion is passing off, opium with ipecacuanha quiets the paroxysms of cough, and gives great ease. It requires to be used in bad cases with the greatest caution. When, however, the cough is extremely violent, and conium and henbane do no good, opium may be given. Dover's powder, with nitre and lobelia, is a good form; or, if this fails, morphine with ipecacuanha may be substituted. (Dr. Parkes.)

1599. *Common attacks of Coryza and Catarrh* may often be cut short, if at the outset a full opiate be given at bedtime, followed by a laxative in the morning.

1600. *Diseases of the Heart.* Dr. Waters considers that in this class of diseases opium should, as a general rule, be avoided, unless special circumstances call for its employment; it has a tendency to lower the circulation, and therefore is objectionable. He is in favour of its use in *Pericarditis;* great benefit, in his opinion, is to be derived from its regular administration in grain-doses every three, four, six, or eight hours; and he states that he has found that great relief to pain which often follows the local abstraction of blood may be equally obtained by the administration of opium. The value of opium in *Rheumatic Pericarditis* has been further attested by Dr. Sibson, Dr. Walshe,[1] Dr. Farre, and others. To be effectual, it requires to be given in large and repeated doses. If the surface has been blistered, morphine may be used endermically. In many diseases of the heart, where opium internally is inadmissible, benefit has been found to result from the subcutaneous injection of morphine (*q.v.*).

1601. *In Internal Hæmorrhage*, opium is a valuable adjunct to acetate of lead and other astringents. It proves highly serviceable in allaying the nervous excitement which so often accompanies profuse hæmorrhage, and it should then be given together with stimulants.

1602. *Diseases of the Abdominal Viscera* comprise a class of diseases especially benefited by opium. *In Peritonitis*, it has been found sufficient of itself to effect a cure. Dr. Stokes has specified the following cases in which it may be thus employed:—1. Peritonitis arising from the escape of fæcal matter into the peritoneal cavity, through a perforating ulcer of the intestine. 2. That arising from the bursting of an abscess into the serous cavity, or from rupture of the intestine, induced by external violence. 3. That occurring after the operation of paracentesis in delicate subjects. 4. Low typhoid peritonitis after delivery. In all these cases, depletion is decidedly contra-indicated; and the indication clearly is to support and strengthen the patient. With this view,

[1] Dis. of Lungs and Heart, p. 694.

and with that also of preventing further mischief, Dr. Stokes advises opium in large doses (gr. j. every hour) until a decided impression is effected. It is extraordinary the large doses which will be borne without inconvenience: in one of Dr. Stokes's cases, the man took 105 grains of opium in eight days, without the slightest cerebral disturbance. Dr. Stokes relates several instances in which the above treatment was eminently successful. Mr. Stanley relates a highly instructive case of *Peritonitis from Injury* which yielded to the persevering use of opium. The patient, a boy five years old, took ℥xxij. of T. Opii per diem for ten days, without any unpleasant symptoms or any unusual amount of sleep. Purgatives were strictly prohibited (this is a point also enjoined by Dr. Stokes), although the bowels were not open for nine days. *In other Abdominal Inflammations, including Enteritis, Gastro-Enteritis*, and *Hepatitis*, opium alone or in combination with other remedies, also proves of signal use.

1603. *In Ulcer of the Stomach*, Dr. Brinton bears the highest testimony to the value of opium. He considers that its efficacy in this class of cases is not due to its sedative or anodyne properties, but rather to its supporting the strength, buoying up the nervous system, and checking the waste or expenditure of the tissues generally. Its great utility is supported by the experience of others. Where vomiting is moderate, or where diarrhœa is prominent, Pulv. Kino Co. is a very convenient formula. But where vomiting is at all excessive, or resists a combination of this powder with bismuth, the drug is generally better borne in a solid form, either as a small pill of the watery extract, or a few grains of the compound soap, or styrax pill, twice or thrice daily. Thus given, its effects are often very striking. *In Perforating Ulcer of the Stomach*, it proves of essential service when given in large and frequently repeated doses.

1604. *In Dysentery*, opium is a remedy of great value, possessing the peculiarity of being applicable, more or less, to every stage, and almost to every form of the disease. It fulfils three important indications—(1) allaying pain and vascular excitement; (2) moderating the peristaltic motion of the intestines; and (3) promoting the cutaneous secretion. On the whole, however, especially at the outset of an acute attack, it is inferior in efficacy to ipecacuanha (*q.v.*), though even here, when the latter drug is employed, a preliminary dose of opium is often of great service in enabling the stomach to retain it, and preventing its emetic operation. There is a great tolerance of opium in this disease, and the dose of solid opium may be gradually raised from gr. j. to grs. iij.–iv., three or four times a day, not only without inconvenience, but with marked benefit. Nausea or vomiting, tympanitic distension of the abdomen, and scanty stools, are signs that the remedy has been carried as far as is consistent with safety. *In Chronic Dysentery*, it is even more valuable than in the acute form, and may with advantage be given in large doses, in combination with acetate of lead, nitrate of silver, or sulphate of copper, as the case requires. *Tormina* and *Tenesmus* are best relieved by opiate enemas.

1605. *In Diarrhœa*, opium is also most valuable. When the attack arises from the ingestion of crude or indigestible food, &c., an aperient should first be given, in order to remove the irritant matter; should the diarrhœa persist after that, opium, either by mouth, or per rectum in the form of enema, will often succeed in arresting it. *In the so-called Summer or Autumnal Diarrhœa*, a combination of opium (T. Opii ℥x.–xx.) and diluted sulphuric acid (℥xv.–xx.) is often effectual. A similar formula is sometimes useful in the *Diarrhœa of Phthisis*. *The Diarrhœa of Childhood* will often yield to a few doses of Pulv. Cret. c. Opio. When the tenesmus and purging continue after the use of castor oil and other remedies, Dr. West states that these symptoms will be more effectually soothed by an opiate enema than by any other means: ℥iij. of laudanum in f℥ss. of mucilage suffices for an infant of a year old.

1606. *In the Passage of Biliary Calculi or Gall-stones*, the intense agony is more effectually relieved by a full dose of opium than by any other remedy, particularly if it be combined with the use of the hot bath. Two grains of solid opium, or ℥xl. of T. Opii, administered either by mouth or in the form of enema, will generally be found sufficient; but should it not prove so, it may be repeated in half an hour. It may be advantageously combined with a full dose of ether or chloroform. Dr. Thudichum regards opium rather as an auxiliary in these cases than to be relied upon alone, and he speaks strongly of the danger of overdosing the patients with opiates.[1] The subcutaneous injection of morphine, observes Dr. Murchison (p. 350), is particularly adapted for cases of this sort, from the rapidity with which it takes effect, and also on account of the irritability of the stomach often leading to the rejection of all remedies taken by mouth. A quarter of a grain of morphine may be injected beneath the skin of the arm, and may be repeated from time to time, according to its effect.

1607. *In Cholera*, opium, either alone or in combination with calomel, &c., was formerly regarded as a sheet-anchor; but clearer views of the pathology of the disease, and experience of its inutility, indeed of its danger, have led to its comparative disuse. In the premonitory or early stage, conjoined with acetate of lead, it apparently assists the latter in restraining diarrhœa; and in some cases it seems to arrest vomiting; but for this purpose it is inferior to chloroform. In very small doses, in a liquid form, as employed by Dr. Ayre (see CALOMEL), it seems to assist the action of other remedies; but its use in large and repeated doses, in the solid form especially, in all stages of the disease, as formerly employed, is now almost universally and justly condemned by those who have had the largest opportunities of studying the disease. Dr. W. Bates relates a case of cholera successfully treated by the hypodermic use of morphine. (*q.v.*).

1608. *In all Spasmodic Affections of the Bowels*, opium in full doses (gr. j.–ij.) proves generally more useful than any other

[1] Ranking's Abstract, 1863, xxxvii. p. 275.

remedy. Fomentations, sinapisms, &c., may be employed at the same time. If obstinate constipation be present, the opium may be combined with calomel, and followed by castor oil or some carminative aperient. *In Colica Pictonum*, and other severe forms of *Colic*, the same plan of treatment may be used with advantage, the opium being repeated till relief is obtained. In severe cases, morphine should be hypodermically employed.

1609. *Obstinate Constipation*, which resists the use of the strongest purgatives, will sometimes yield to opium in large doses. It acts mainly by relaxing the spasm of the muscular coat of the intestines, on which the constipation depends. In such cases, strong irritant purgatives only serve to increase the mischief. The advantages of opium compared with purgatives in severe cases of *Obstruction of the Bowels*, are well set forth by Dr. G. Evans. As a general rule, belladonna is preferable to opium in the treatment of *Intestinal Obstructions*, including *Intussusception of the Bowels*, but there are cases on record, notably one by Mr. Hardwick,[1] of Sheffield, in which recoveries have followed the use of opium in large and repeated doses. In Mr. Hardwick's case, the patient took in all 30 grains in forty-one hours, without the slightest sign of narcotism. In these cases purgatives should be strictly avoided.

1610. *In Chronic Catarrh of the Stomach*, when there is much irritability of that viscus, or vomiting of mucus, opium has a special value. Its action may often be assisted by its combination with astringents, particularly with Pulv. Kino Co. Its beneficial effect appears to be twofold: locally it allays the irritation of the stomach, and checks excessive mucous secretion; while by tranquillizing the nervous system and procuring sleep, it restores the tone of the digestive organs, and frequently enables the patient to digest solid food. Opium is also of use in cases of *Subacute Inflammation of the Stomach*, when great nervous irritability and atony coexist; in these cases it may often be advantageously combined with nitrate of silver (*q.v.*). (Dr. Wilson Fox, ii. p. 887.) *In Pyrosis*, Dr. Pavy (p. 134) states that he has rarely found the following draught fail in affording speedy relief:—℞ Liq. Opii Sed. ℥viij., Infus. Gent. Co. f℥j. M. To be taken thrice daily.

1611. *Nervous or Sympathetic Vomiting* sometimes yields to a few drops of laudanum given in an effervescing draught. Dr. Pavy mentions an obstinate case of vomiting, which, after all other remedies had been used in vain for weeks, yielded to morphine gr. ss, thrice daily. *In Vomiting connected with Uterine Disease*, Dr. Tilt states that he has seen it checked by gr. j. of acetate of morphine applied to the cervix uteri. Mr. Harrison[2] relates an obstinate case of *Vomiting during Pregnancy* cured by prolonged hypodermic injections of morphine. In these cases, Dr. Graily Hewitt remarks that an opiate liniment rubbed over the hypogastric region, or morphine employed endermically, has been found of great service. In severe cases a few drops of laudanum may be used in beef-tea as an enema, repeated as necessary. Opium in

[1] Brit. Med. Journ. July 1, 1876. [2] Brit. Med. Journ. Aug. 22, 1868.

the same manner, has been advised as a preventive or cure of *Sea-sickness*, but it too often fails to produce any good effect.

1612. *In Dropsy*, opium has sometimes been thought useful by diminishing irritation and promoting the cutaneous secretion. Dr. Graves speaks very favourably of its influence in these cases, especially when conjoined with the daily use of the vapour bath. "There seems," he observes, "to be an analogy between chronic dropsy and diabetes, and experience has proved to me that this mode of treatment is most likely to be attended with success. Opium and other diaphoretics," he adds, "increase the strength, remove dropsical swellings, diminish the quantity of albumen in the urine, and bring on convalescence, without producing any bad effects on the head or digestive system."

1613. *Diseases of the Genito-Urinary Organs. In Inflammatory and Irritable States of the Kidneys*, opium is a remedy of great value. Its action is much assisted by the plentiful use of diluents, the hip-bath, and large linseed-meal poultices over the lumbar regions. In robust subjects, local depletion by cupping or leeching may advantageously precede the use of opiates. *In Nephralgia, caused by the presence or passage of Renal Calculi*, opium in full doses is the remedy most calculated to afford relief. The hot hip-bath and plentiful diluents should also be used at the same time. In all those cases where opium given by mouth fails to afford relief, it will often succeed when employed in the form of enema or suppository. The subcutaneous injection of morphine is far more effectual than any of these modes of administration.

1614. *In Calculous Diseases*, the most generally useful medicine we possess is opium. Whatever may be the character of the calculus, whenever much pain and constitutional irritation are present, opium proves signally beneficial. It may be given by mouth; also in the form of enema or suppository; or it may be applied externally as a plaster. Some patients derive more benefit from one preparation of opium than from another. Solid opium, Liq. Opii Sed., or Dover's powder, are the most generally useful forms. Morphine and its salts do not seem to exercise the same beneficial influence as opium itself. It may be given in full doses (gr. j.–ij.), and repeated until relief is obtained; large doses will generally be borne without inconvenience. Sir T. Watson believes that no single drug has so much power to render alkaline urine acid as opium.

1615. *In Cystitis*, opium proves of the greatest value, especially when its action is aided by the use of the hot hip-bath, fomentations, and linseed-meal poultices well sprinkled with mustard, over the hypogastric region. Sir H. Thompson states that a suppository of morphine (gr. ss.–j.) is often of the greatest service. A favourite suppository of Liston was a combination of opium (gr. ij.–iv.) and extract of hyoscyamus (gr. x.–xv.). "Its effects," he remarks, "are almost instantaneous; all pain goes off; the patient becomes quiet, loses all recollection of his former sufferings, and often remains in a state of enviable comfort for twelve

or sixteen hours. The suppository may be repeated as need be; the preferable time for its exhibition is the hour of sleep." *In Subacute and Chronic Cystitis*, Dr. West (p. 600) speaks of opium, in some form or another, as the remedy on which our greatest dependence must be placed, and of its value far exceeding any medicine supposed to exert a specific influence on the bladder. Alkalies and copious mucilaginous diluents should also be given. *In Irritable States and Painful Affections of the Bladder*, the above treatment, modified according to the urgency of the case, may be had recourse to with advantage. It proves in many instances essentially useful in alleviating the severe pain occasioned by the *Presence of Calculus in the Bladder*. In such cases it is best administered in the form of enema or suppository.

1616. *In Spasmodic Stricture of the Urethra*, and in *Inflammatory Retention of Urine*, a hot bath and a full dose of opium, followed by a dose of castor oil, will often suffice to give relief in recent cases of no great severity following a debauch, exposure, &c. Mr. Savory[1] insists on the importance of absolute rest in the recumbent posture, assisted by warmth, in the form of baths or otherwise, as an adjunct to opium, which is often so valuable in these cases: it is perhaps, he thinks best administered as laudanum, but this or some other form of it may be given by mouth, or morphine injected subcutaneously. He regards it as vastly superior to belladonna (*q.v.*). By its judicious use he thinks manual interference may often be obviated. Sir H. Thompson, however (p. 78), strongly deprecates the delay which must occur in this treatment, and advocates a speedy resort to the catheter.

1617. In *Gonorrhœa*, in the acute stage, Mr. Morgan has found great relief from opiate injections (℞ T. Opii ♏xxx.–lx., vel Ext. Opii Aquos gr. j., Aq. ℥j.) applied so as to reach the deeper parts of the urethra. *In Spermatorrhœa*, he also states that he has found a sedative solution (℞ T. Opii ♏xxx., Aq. ℥j.), used night and morning, most efficacious in allaying hyper-sensibility, except in those rare and severe cases which require stronger local applications by the *porte caustique*.

1618. *In Acute Orchitis*, Mr. J. Rouse[2] pronounces the treatment by opium "the simplest, most satisfactory, and most efficient." After a purgative, he commences with opium (gr. j.) night and morning, and gives, at the same time, ♏xx. of T. Ferri Perchlor. thrice daily; the testicle to be supported, and kept enveloped in a hot fomentation of Liquor Plumbi and laudanum, which is of considerable use in producing ease. In ordinary cases nothing else is necessary. Improvement speedily ensues, and a cure is effected in about a week. This treatment seems well worthy of further trial.

1619. *In Diabetes*, the beneficial influence of opium has long been recognized, but it has generally been looked upon rather as a palliative than a curative agent. This view, however, is combated by Dr. Pavy, who is satisfied, after extensive experience, that it

[1] Brit. Med. Journ. Dec. 20, 1873. [2] St. George's Rep. 1870, iv. p. 251.

exerts a direct remedial effect on the disease. He states that he knows no medical agent capable of exerting a controlling influence over the disease like that exercised by opium. He admits that alkalies and ammonia exercise a slowly beneficial influence on the complaint, but he has never observed from their use the immediate and striking effects obtainable from opium. He mentions one case in particular, in which it effected a direct and perfect cure. It should be given in full doses, and it is worthy of remark that diabetic patients will bear large doses of opium without its producing its ordinary soporific effect. It is best adapted for old cases occurring in the aged. See also CODEINE.

1620. *In Cancer of the Uterus*, opium stands first in the list of palliatives, quieting constitutional irritation, and allaying local pain. For this purpose it requires to be given by mouth, in large and repeated doses, and per rectum in form of enema or suppository. Morphine introduced hypodermically is superior to either of these modes of administration. The dose must be regulated by the amount of relief afforded. *In Uterine Inflammation*, Dr. Tilt considers the local application of opiates, in suppositories or enema, more effectual than their internal administration. For the relief of *Uterine and Ovarian Pain* of a non-inflammatory character, Dr. Graily Hewitt (p. 379) states that one of our best remedies is a combination of Battley's Liq. Opii Sed. and Sp. Æther. Sulph. Co. *In Irritable Uterus*, opium gives more speedy relief than any other remedy; but as Dr. Graily Hewitt observes (p. 365), the long-continued use of opiates in these cases is perhaps the worst form of treatment that could be devised. Gooch found that the patients who remained longest uncured were those who gradually accustomed themselves to a daily enormous allowance of opium. When congestion exists, a few leeches should precede, and in many cases may obviate the necessity for, the use of opiates. In these cases, and in *Ovarian Irritation*, pessaries of opium (gr. ij.), as originally advised by Dr. Churchill, often afford marked relief.

1621. *In Dysmenorrhœa*, when the pain is very severe, opiates are necessary, and are best used in the form of enemata; but in simple or ordinary cases we can dispense with opium. (Dr. Graily Hewitt.) It may often be advantageously combined with camphor. A hot linseed-meal poultice sprinkled with laudanum, applied to the hypogastrium, often affords relief. When the pain is habitually severe, one hypodermic injection of morphine will often be sufficient at each menstrual period. In the hypodermic use of morphine we have, observes Dr. West, a speedy and almost unfailing means of controlling even the severest attacks of pain.

1622. *In Suppression of the Menses, consequent on violent mental emotions*, opium is a most valuable remedy. In cases of sudden suppression in young women of weakly habit, who have been subjected to disturbing emotional influences at the menstrual period, opium and a supply of good nourishment should be freely given, and rest and quietude enjoined. (Dr. Graily Hewitt.) *In*

Sudden Suppression from a Chill, the action of the skin should be excited by placing the patient in bed and giving Dover's powder (gr. x.–xv.), and applying sinapisms to the hypogastric region, and hot-water bottles or bags to the loins. Cupping over the loins, or leeches to the vulva, may also be had recourse to.

1623. *In threatened Abortion*, opium proves in some instances of great value; but caution is necessary in its use. Dr. Lever has ably pointed out those cases in which it may be used with advantage, and those in which it is inadmissible. When abortion occurs from fœtal disease or imperfection, so that the premature emptying of the uterus is but an effort of Nature to get rid of that which she cannot accomplish; if, with the discharge, there is a patent state of the os uteri, and if the cervix be soft and loose, the exhibition of opium will do harm by retarding the emptying of the uterus, which must sooner or later take place. When, however, it arises from accident, or from mental causes, or from those which may be said to be due to habit, he has known the exhibition of opium by mouth, or, what is better, a cold starch injection with opium, thrown into the bowel, and repeated every night or oftener, according to existing circumstances, followed by the best results. Application of cold, perfect quietude, and unstimulating diet should be enforced. When, however, *abortion has taken place*, especially if the event has been attended with much loss of blood, opium, in almost every case, may be given not only with safety, but with benefit. It will then allay excitement, tranquillize the circulation, and procure sleep.

1624. *In Parturition*, there can be no doubt of the value of opium in certain stages and under certain circumstances, but its indiscriminate use cannot be too strongly condemned, as the large and repeated doses in which it has too often been administered are apt to exercise a prejudicial and even fatal influence on the fœtus. Many of the indications for which opium used formerly to be given are now fulfilled, and with greater certainty and speed, by chloral (*q.v.*), or by anæsthetics (see CHLOROFORM).

1625. *In Uterine Hæmorrhage*, opium exercises a powerful influence, partly in virtue of its special hæmostatic action, and partly from its power of increasing uterine contraction. According to Dr. Broadbent,[1] a drachm of laudanum, taken in brandy, will rally exhausted strength, restore consciousness, rouse the uterus to action, and arrest bleeding, when six times ten minims in water would allow the patient to bleed to death.

1626. *In Puerperal Convulsions*, opium is not held in the esteem it formerly was, their treatment by chloroform and chloral, with bromide of potassium, having been found to yield more speedy and satisfactory results. Cases, however, are on record, successfully treated by the subcutaneous injection of morphine (*q.v.*).

1627. *In Puerperal Fever*, opium is a very valuable remedy. It tends in a marked degree to allay the pain, and to reduce the excitement of the nervous and vascular systems. Dr. Churchill

[1] Practitioner, Feb. 1877.

speaks highly of its efficacy. He states that he has seen cases yield to the administration of one grain of opium, repeated every hour until the symptoms have subsided. Opium in some form, observes Dr. Matthews Duncan,[1] is invariably administered in puerperal fever, and almost always with advantage. Occasionally, indeed, it produces great mental disturbance, vomiting, &c., and hence, if a change of preparation does not bring better results, it may have to be given up, or used only to secure a good night. But generally it is given repeatedly during the day, either to relieve pain, or with a view to its soothing and supporting, rather than narcotizing action. The tolerance of opium in this disease is very marked. The great value of opium in *Pelvic Inflammation* is lucidly set forth by Dr. Lauchlan Aitkin,[2] who considers that opium or morphine suppositories, frequently repeated, or the subcutaneous injection of morphine, are generally the best forms of administration. *In Puerperal Intestinal Irritation*, after the bowels have been well cleared out, opium, either alone or combined with alteratives, is highly serviceable. It may also be given in the form of enema. *Puerperal Diarrhœa* may often be effectually arrested by a few drops of the tincture, either alone or in combination with the mineral acids.

1628. *Diseases of the Eye, Ear, and Throat. In Purulent, Gonorrhœal, Variolous, Scrofulous, and Catarrho-Rheumatic Ophthalmia*, Vinum Opii (B. Ph. 1864), either pure or diluted, with one or two equal parts of water, forms an excellent application. It should never be of sufficient strength to cause much pain. It is particularly useful when there is much scalding pain, lacrimation, and photophobia. The wine of the present Pharmacopœia is objectionable, from its containing spices which would aggravate the mischief. (Ringer.) *In Ophthalmia Tarsi*, it proves useful. In these cases, the pain may often be relieved by applying the vapour of a warm solution of opium, by means of a proper glass, to the eye.

1629. *Otalgia* is often speedily relieved by the introduction into the external meatus of a piece of cotton-wool soaked in equal parts of tepid laudanum and olive oil. In some forms of *Deafness*, the endermic use of opium proves serviceable. (See MORPHINE.)

1630. *In Toothache*, a piece of solid opium, or cotton-wool saturated with the tincture, introduced into a carious tooth, frequently affords temporary relief.

1631. *In Ptyalism*, opium has been given internally with the view of arresting the excessive discharge.

1632. *In Acute Rheumatism*, the treatment by large and repeated doses of opium, originally proposed by Dr. Cazenave, of Pau, was strongly advocated by Sir D. Corrigan, of Dublin, and the cases recorded by him, Dr. Sibson, and others, demonstrate its power and value as an anti-rheumatic. Sir D. Corrigan generally commences with gr. j., every two or three

[1] Lancet, Nov. 6, 1880.

[2] Edin. Med. Journ. April 1870.

hours, and recommends the dose to be increased, both in frequency and quantity, until the patient feels decided relief, when it should be kept up at that dose until the disease is steadily declining. The average quantity required in twenty-four hours is about gr. xij., and even that quantity does not affect the head; occasionally he found it produce diarrhœa, which required astringents to check it. The tolerance of opium in this disease is very remarkable. As a general rule, the continuance of pain is the best practical test of the propriety of its administration, and of the extent to which its exhibition is required; and whether ten or two grains only are needed in the course of the day, it may be given with impunity, and indeed with advantage, as long as pain and restlessness continue. Its only contra-indication is the suspension of secretion; the only circumstances calculated to point to its having been given in too large doses, the supervention of stupor or narcotism. *In Rheumatic Carditis*, opium is of all remedies that which comes most powerfully in aid of blood-letting and mercury. In every case, opium in *full doses* is indispensable. The treatment of acute rheumatism by opium, although but seldom resorted to at the present day, yet offers many advantages, and may not unfrequently prove serviceable when salicylates are badly borne. If, after all active symptoms have subsided, there remains much irritability of the heart, it is expedient, whilst attending to the general health, to administer occasional doses of opium and digitalis, and to apply an opium or belladonna plaster to the chest. *In Chronic Rheumatism*, opium is valuable in relieving pain and in procuring rest, but beyond this it appears to have little influence. Dover's powder is one of the best forms of exhibition. Diligent friction with opium liniment is often serviceable in *Lumbago*, *Crick of the Neck*, and other local rheumatic affections. An opiate plaster is also productive of comfort in this class of cases.

1633. *In Gout*, opium, as an internal remedy, is of little value if indeed it be not prejudicial: not so as an external application. A linen compress, soaked in tepid laudanum, applied locally, often affords marked relief. A solution of hydrochlorate of morphine (grs. viij., Aq. ℥j.) is a more elegant and equally effectual application.

1634. *In Phlegmasia Dolens*, Dr. Graves advises anodyne ointments and large doses of opium internally. Some patients, he adds, if the bowels be regulated, will bear from gr. iv.–v. or even gr. vj. of opium in the day, when the disease has advanced to the second stage.

1634*. *In Cancer*, opium, in large and increasing doses, has been employed with the view of alleviating the patient's sufferings.

1635. *In Mortification*, opium is an invaluable remedy. It soothes the pain, and diminishes the restlessness and irritability with which mortification is so often accompanied, and frequently procures sleep. It is especially indicated when spasms or convulsions arise in the progress of the disease. *In Sloughing Phagedœnic Ulcerations*, Dr. Tweedie states that he has seen the most astonish-

ing results from large doses of opium; and I can bear witness, in my own practice, to its value in these cases. *In Chronic Ulcerations*, especially of the lower extremities, Mr. Skey speaks highly of the value of opium administered internally. He considers no other remedy as comparable to it. Mr. C. Heath[1] also speaks highly of it in ulcers of the legs; he has found it of greatest service, however, in the small irritable *Ulcer often found in combination with Varicose Veins*, and also especially in any form of ulcer in which a sloughing action has supervened.

1636. *In Carbuncle*, Sir J. Paget,[2] who does not place much reliance on internal remedies in this affection, remarks that opium is often very valuable, especially in all the earlier stages, in which it relieves suffering as thoroughly as incisions or any other measure. After the early stages, however, he regards it as unnecessary, except for some patients who are unable to sleep.

1637. *In Syphilis*, opium is of great value in persons whose strength is worn out by disease, long courses of mercury, debauchery, &c. In such cases, by the free use of opium, sleep is obtained, the appetite returns, and *Obstinate Ulcers* heal. Opium is also necessary to allay the pain of *Iritis*, *Periostitis*, and other local affections; its influence is usually more decided when conjoined with some form of iodine or mercury. (Hill and Cooper, p. 433.) *In Syphilitic Eruptions, and Syphilitic Sore Throat* attended with *Phagedœnic Ulceration*, opium is a valuable means of quieting the constitutional disturbance, and arresting the progress of the disease.

PANCREATINE. Pancreatized Foods. See MALT and PEPSIN.

1638. PAPAVERIS CAPSULÆ. Poppy Capsules.

Med. Prop. and Action. Sedative, anodyne, possessing the properties of opium in a milder and varying degree. The extract (*infra*) is the best form for internal use; it is milder in its operation than opium, and is considered to produce less nausea and excitement. The syrup, which is a common ingredient in cough mixtures, &c., for children, is objectionable on account of its varying strength, and from its rapidly fermenting at high temperatures. Fomentations of the decoction (ʒij., Aq. Ojss., boiled to Oj.) act as an anodyne, though much of the effect is due to the combined heat and moisture. The seeds yield a bland oil.

Dose:—Of the Extract of Poppies, gr. ij.–v. *Of the Syrup*, fʒj.–ij.

1639. *Therapeutic Uses.* See OPIUM.

1640. PARAFFINUM DURUM. Hard Paraffin. B. Ph. 1885.
PARAFFINUM MOLLE. Soft Paraffin. Vaseline. B. Ph. 1885.

The hard paraffin is a mixture of the harder members of the paraffin series of hydro-carbons. It was introduced into the B. Ph., and used as a base for several ointments.

The soft variety is a semi-solid mixture of some of the more fluid members of the paraffin group. It forms an adjunct in the

[1] Practitioner, Aug. 1869. [2] Lancet, Jan. 16, 1869.

preparation of eleven ointments in the B. Ph. of 1885. Both varieties of paraffin form excellent bases, being free from any tendency to turn rancid, or to undergo any change of decomposition.

1641. PAREIRÆ RADIX. Pareira Root. PAREIRA BRAVA.

Med. Prop. and Action. Mild tonic and diuretic. It is advantageously given in infusion (gr. ccclx. ad Aq. Ferv. Oj) in doses of ʒjss.-ij. three or four times daily. The root contains a peculiar alkaloid. *Cissampeline;* a bitter yellow matter, some resin, starch, and salts. The properties of the plant are supposed to depend on the alkaloid. It appears to exercise a specific action as an astringent and sedative on the mucous membrane of the genito-urinary system.

Dose:—Of the powdered Root, gr. xxx.-lx. *Of the Extract*, gr. x.-xxx. *Of the Liquid Extract*, ʒss.-ij. *Of the Decoction*, ʒj.-ij.

1642. *Therapeutic Uses. In the advanced stages of Acute and in Chronic Inflammation of the Bladder,* Pareira Brava proves particularly useful. *In the advanced stages of Cystitis,* after the employment of Uva Ursi (*q.v.*), Dr. West (p. 598) advises the following:—℞ Ext. Pareiræ gr. xlviij., Acid. Hydrochlor. Dil. ♏xl., Morphinæ Hydrochlor. gr. ss., Decoct. Pareiræ ʒvj. M. ʒjss. to be taken every six hours. Wine and tonics—anything in fact which will improve the general health—are often of service when the acute stage is passed.

1643. *In Catarrhal Affections of the Bladder,* Dr. Prout considers that pareira is undoubtedly one of the best remedies we possess. *In Cystirrhœa,* it has been given with unequivocal benefit. The above formula may be employed.

1644. PAULLINIA SORBILIS, *Martius.* Guarana.

Med. Prop. and Action. The seeds washed, bruised, and pressed into cylindrical masses constitute guarana paste, which, when finely pounded, is known by the name of Paullinia powder. This is light brown in colour, has an odour faintly resembling roasted coffee, and a bitter astringent taste. It contains an empyreumatic oil, tannic acid, and guaranine, a substance identical in composition with caffeine and theine. The large proportion of tannic acid it contains renders it very effectual as an astringent: whilst, owing to the guaranine, it exercises much the same effect on the nervous system as tea or coffee.

Dose:—Of the Powder, gr. x.-xv., once a day, or oftener, either alone or mixed with an equal quantity of sugar. (Posner.[1])

1645. *Therapeutic Uses. In Migraine, or Sick Headache,* guarana was introduced into British practice by Dr Wilks,[2] who in his own practice and that of his friends used it with very encouraging results. Drs. Anstie[3] and Macdowall[4] have also used it in half-drachm doses with success; but, like other remedies, it not unfrequently fails. It seems chiefly adapted for the sick headaches of hysterics. On the Continent it is employed in many forms of *Neuralgia.*

1646. *In Lumbago,* Dr. Rawson[5] obtained speedy relief from guarana, in doses of gr. xv. increased to gr. xl. daily. He tried it

[1] Cited by Dr. Latham in Brit. Med. Journ. April 27, 1872.
[2] Brit. Med. Journ. April 20, 1872.
[3] Practitioner, Dec. 1872.
[4] Practitioner, Sept. 1873.
[5] Irish Hosp. Gaz. April 15, 1874.

in a large number of cases of *Chronic Rheumatism* with varying results. When the pain was acute, coming on with sharp stings, it acted like magic; but when the pain was of a dull aching character, it was slower in its action, and several doses had to be taken before any decided benefit was manifested.

1647. *In Catarrhal Diarrhœa*, and *Blennorrhœa of the Urinary Organs*, it has proved useful as an astringent. *In Infantile Diarrhœa*, it is regarded as specially indicated, since, besides acting as a styptic, it may serve as a nutrient. (Posner, *op. cit.*)

1648. Pepsin. Peptonized Foods, &c. Extracts of Meats, &c. Pepsin is a preparation of the mucous lining of the fresh and healthy stomach of the pig, sheep, or calf.

Under the article Malt, the whole subject of the therapeutic uses of diastase and artificially prepared maltose foods was considered. In this place will be reviewed, firstly, the uses of pepsin, and then the best modes of peptonizing foods, and the administration of such aliment.

Peptones may briefly be defined as assimilable proteids, or the flesh moiety of our daily diet. Peptones are necessary for tissue reparation and the due performance of the body's work. They normally are elaborated in stomachic digestion by the action of pepsin, and in intestinal digestion by the action of a ferment derived from the pancreas and kindred to pepsin—namely, trypsin.

Pepsin, a hydrolytic ferment, acts only in the presence of an acid; while trypsin is inoperative unless in an alkaline solution.

Further, a certain degree of heat destroys either ferment, while acid robs trypsin of all proteolytic action. In certain pathological states the ferments in question fail to act. This failure may arise from deviation from the normal reaction of the digestive fluid, from lack or imperfect supply of the ferments themselves, or even from any cause which prevents the stomach or intestines from retaining for a due time the contact between the ferment liquid and the food to be acted upon.

To remedy these defects it has become a therapeutic method to administer foods in part peptonized, so that the main labour is removed from the digestive system, absorption alone being requisite. The pharmaceutical preparations are very numerous indeed, but by far the larger number are worthless. Among many observers who have tested the respective digesting powers of the commercial articles, Dr. Dowdeswell[1] finds the following preparation to be upon the whole reliable:—Glycerin of Pepsin (Bullock), Liquor Pepticus (Benger), Pepsina Porci (Bullock), and the B. Ph. Pepsina, as prepared by Messrs. Wright and by Messrs. Hopkins & Williams. Peptonized foods—foods, the proteids of which have artificially been converted into peptones—consist of those converted by pepsin, and those converted by trypsin. The first class are usually very nauseous, and repugnant to the patient, while the latter are liable to have the trypsin destroyed in passing through the stomach.

[1] Practitioner, l. xxii. p. 192.

Dr. Roberts, in his elaborate researches upon artificial foods and their digestion, advises the administration of pancreatized foods at the close of a meal with gr. xx. of Sodii Bicarb. It is supposed that the residual acid will be neutralized and the trypsin thus guarded.

He recommends peptonized beef-jelly, prepared by digesting beef with pancreatic fluid, and stiffened by the addition of gelatine. Common beef-tea contains only non-albuminous material; peptonized beef-jelly is very rich in peptones, containing as much as 9·9 per cent. of organic material.

Peptonized wheat-jelly consists of wheat-flour digested with pancreatic fluid, and then stiffened with gelatine. In this the starches are changed into dextrines and sugars, and the gluten is converted into soluble peptone.

Milk can be perfectly well peptonized by the pancreatic method, whereas, if acted upon by pepsin, it becomes intolerably bitter and nauseous. Dr. Roberts finds, however, it is best to carry the peptonization process only to a certain stage—namely, to one of partial conversion. The natural powers are adequate to accomplish the remaining part of the process, and thus the prepared food retains its palatable character.

It would be wholly beside our question for us to enter in detail upon the various functions put into action by pancreatic juice. We may, however, indicate that as it acts upon *all* the constituents of food, it possesses peculiar and irresistive claims over those of pepsin as a therapeutic agent in preparing artificially digested food.

Pancreatized foods may be administered by the mouth, when the precautions above indicated should be carried out, or in the form of enemata or suppositories. It is manifestly improper to employ undigested food enemata, since the mucous membrane of the rectum can have little or no action upon them, and the extent to which their nutrient principles are absorbed must be very slight.

Dose:—Of Pepsin, gr. ij.–v., to be taken immediately before or with a meal. Dr. H. Wood places the minimum dose for an adult at gr. xxx.; gr. xv.–xx. is a fair average dose. Children bear well proportionally large doses: to a baby six months old he prescribes gr. v. in a little acidulated water after each feeding.

1649. *Therapeutic Uses.* In *Fevers*, when rapid decomposition of the nitrogenous material of the body is associated with *a Weak and Enfeebled Digestion*, pancreatized foods are of peculiar service.

1650. *The Wasting Diseases of Children. Marasmus* in its Protean forms, are treated by these foods with the best results.

1651. *In Atonic and all forms of Deranged Digestion*, peptonized foods, by supplying nutrition without exercising the already overtaxed digestive system, give the best chance to Nature to restore health and tone to the mucous membrane of the alimentary tract.

1652. *Organic Diseases of the Stomach or Intestine*, including *Ulceration*, whether *Simple* or *Carcinomatous*, may have some of their greatest horrors removed by using pancreatized food enemata. Dr. Roberts gives the following recipe for pancreatizing milk:—One pint of milk is to be diluted with half a pint of water, and

heated to 150° F. It is then placed in a covered jug, and Liq. Pancreat. ʒj. and Sod. Bicarb. gr. xx. are added. The jug is then placed in a warm place and covered over with a cosey for about an hour. Milk so prepared is quite palatable, but will not keep more than twelve hours.

1653. *In Dyspepsia connected with Deficient Secretion of Gastric Juice*, pepsin seems to be especially indicated. *In Atonic Dyspepsia*, Dr. Wilson Fox (Syst. ii. p. 821) bears strong testimony in favour of pepsin, and also in some conditions where the digestive process is impaired by irritative states of the mucous membrane. It may often be advantageously taken with hydrochloric acid at meal-times. It may be given conjoined with other medicines, which do not at all impede its therapeutic action: thus, with hydrochlorate of morphine, to relieve violent pain of the stomach; with strychnine, to stimulate peristaltic movement; with nitrate of bismuth, lactate or iodide of iron, &c.

1654. *In Obstinate Vomiting of Pregnancy*, pepsin is a remedy of great power. It was first used for this purpose by Dr. Le Gros, who relates seven cases in which it proved signally beneficial. In one case in my own practice it proved effectual when all other means had failed.

1654*. Other forms of *Vomiting* sometimes yield to it. Dr. Garrod (p. 402) mentions the case of an old man (æt. 90) who suffered from vomiting or regurgitation after each meal, apparently arising from debility of the stomach, cured by a few grains of pepsin mixed with his food.

1655. *In Spasmodic Asthma*, dependent on gastric disturbance, pepsin, with dilute acid, has been known to produce most beneficial results when all other remedies have failed. (Garrod.)

1656. *The Diarrhœa of Children*, which resisted ordinary means, was found by Dr. A. Davidson[1] to yield to pepsin wine in doses of a teaspoonful three or four times a day; or in the case of infants it may preferably be given as advised above by Dr. H. Wood.

1657. Petroleum. Rock Oil. A bituminous treacle-like exudation from the soil in the East and West Indies.

Med. Prop. and Action. Terebinthinate stimulant, and expectorant. Externally applied, rubefacient. As an antiseptic in surgical practice some trials have been made with it by Sir J. Fayrer,[2] and he comes to the conclusion that it possesses some, if not all, the advantages of carbolic acid in this character. He used it pure, or diluted with equal parts of oil or glycerine, and he states that whilst it certainly has some deodorizing power, it appeared also to have that of limiting suppuration, and of restraining the development of septic miasmata in the discharges. He likewise found it useful as a stimulant and detergent application to *Sloughing and Ulcerated Surfaces*, and in one case of *Carbuncle* it proved most efficacious. The evidence of its virtue, observes Sir Joseph, is as yet limited; but yet it is such as to suggest the advantage of making further trial of what may prove to be a valuable addition to our surgical resources. Appended to the paper are summaries of twenty cases treated by this agent. It may deserve further notice as an Indian source of Vaseline and Paraffin—both petroleum products.

Dose, gutt. xx.–xxx. in emulsion, or in any convenient vehicle.

[1] Practitioner, March 1872. [2] Indian Med. Gaz. Sept. 1869.

1658. *Therapeutic Uses. In Asthma and Chronic Coughs*, unattended with inflammation, it has been given with the effect of stimulating the expectoration. Dr. Milton[1] of Bradford, Pa. (U.S.), has specially called attention to its efficacy in *Incipient Phthisis*, and *Bronchial Affections* generally. He gave it, incorporated with any vegetable powder, in the form of pill, gr. iij.–v. from three to five times a day. He found it also beneficial in *Asthma*.

1659. *In Chronic Rheumatism*, it has been used externally and internally with great advantage. Speaking of the Rangoon petroleum, Dr. Fleming[2] states that he has found more benefit from it than from the most costly cajeput oil. *In Paralytic Affections*, it has also proved serviceable.

1660. A case of *Beriberi*, successfully treated by petroleum externally and internally, is related by Mr. S. Arokeum,[3] but how far the recovery was due to this agent is doubtful.

1661. *In Chronic Skin Diseases*, it is a useful application. Dr. Mudge relates an obstinate case of *Chronic Eczema* which, after a variety of other means had failed, yielded to petroleum incorporated with soap (℥j. ad Sapon. ℥j.). *In the Scabies of Children*, Dr. Monti,[4] of Vienna, has successfully employed a combination of petroleum and olive oil or glycerine, equal parts, or 3 of petroleum to 1 of the diluent. Its efficacy, with black soap as an adjunct, is testified to by Dr. H. MacCormac:[5] he speaks of it as an excellent remedy for itch, removing it with ease and safety. He speaks also of its great power in *destroying Pediculi;* and mentions two or three cases where they infested the whole body, in which the petroleum ointment (1 to 2 to lard), with black soap and the warm bath, removed the parasites with magical celerity. *Porrigo, Tinea Favosa*, and other *Parasitic Skin Diseases*, were treated by him by the same means with great success.

1662. Phosphorus. Phosphorus.

Med. Prop. and Action. Nervine, tonic, and stimulant; in overdose poisonous. In small medicinal doses it produces no well-marked physiological effects, but the nervous system, if previously impaired or debilitated, gradually manifests increased strength and vigour; and this is probably due to its supplying the phosphatic element to the nervous tissue, which may be presumed to be deficient in those cases, from the fact that in the cases of overtaxed nervous energy it has generally been observed that the urine contains an excess of phosphatic matter. Its action on the nervous system is probably analogous to that of iron on the blood. Solid phosphorus given in as small a dose as 1½ grain acts as a poison, death seeming to take place in a gradual and painless way, with perfect retention of consciousness. There may be some vomiting, and the substances ejected appear luminous in the dark, as also does the stomach itself after death when cut open in a dark place; but it is rare to find any marked inflammation of this organ. In the case of a bird poisoned by eating several grains of phosphorus, Dr. Thorowgood, whose remarks we are quoting, could find scarcely a trace of inflammation anywhere in the digestive tract. In a case recorded by Casper, where a dose of three grains of phosphorus proved fatal to a lady in twelve hours, the body after death presented the extraordinary phenomenon of luminous vapour issuing

[1] Practitioner, April 1880.
[2] Asiatic Researches, ix.
[3] Madras Med. Journ. July 1863.
[4] Practitioner, Nov. 1868.
[5] Practitioner, Oct. 1865.

from each of its outlets. Analysis of the various tissues of animals poisoned by phosphorus has demonstrated the presence of phosphoric acid in unusual amount; this arises from the oxidation of the phosphorus in the body. Phosphoric acid is also increased in the urine of those who have taken any preparation of phosphorus. The action of phosphorus, as a poison, appears not to be due to any direct action on the nervous system, but to its preventing the assimilation of oxygen by the constituents of the blood; by thus checking oxidation it may cause the fatty degeneration of the liver so often met with in those who have been poisoned by phosphorus, and which is doubtless connected with the symptoms of severe icterus so often seen in the patients before death. (Dr. Thorowgood.[1]) The power of phosphorus in inducing fatty degeneration of the heart, liver, kidneys, and other organs is very remarkable, not the least noticeable feature being the rapidity with which it operates. In a case recorded by Habershon, on the fifth day, after a dose of five grains of phosphorus, all the organs were the seat of fatty degeneration. According to Schraube,[2] the affection of the heart is almost invariable in phosphorus poisoning. The fumes of phosphorus cause violent irritation of the mucous membranes of the air-passages, nostrils, and eyes, and persons exposed much to its vapour in manufactories are liable to necrosis of the lower jaw. Externally applied, it is a violent irritant.

Poisoning by Phosphorus. The treatment which seems to hold out the best prospect of success, in the absence of any known antidote, is to commence with an emetic of sulphate of copper, followed by ʒij. doses of oil of turpentine, which with the phosphorus in the stomach forms an inert crystalline mass. Bamberger recommends gr. iv.–viij. of carbonate of copper every half-hour, each dose being followed by a spoonful of vinegar in water, and after a few doses an emetic of sulphate of copper. Oil should be avoided, but mucilaginous drinks may be taken freely. Collapse should be treated with stimulants excluding all ethereal compounds.

Dose, gr. $\frac{1}{40}$–$\frac{1}{20}$ in pill or capsule, made by melting finely divided phosphorus with fat, and then covering the pill with an impermeable covering. The solid form, however, is objectionable; a preferable form is a solution in oil prepared by gently warming phosphorus (2 parts) in almond oil (100 parts) for about twenty minutes in a flask that is closed so as almost to exclude the air; when cool, the oil is to be decanted off from the undissolved phosphorus. Of this the dose is gutt. iij.–viij. in emulsion or with cod-liver oil. A solution in ether (gr. iv. ad Ether. fʒj.) has also been employed in about the same doses. The great objection to both these formulæ is their nauseous taste. Garrod (p. 22) says that it is best given in capsules after meals. All the good effects of phosphorus, without its drawbacks, are to be obtained probably by the use of the alkaline hypophosphites or the phosphide of zinc (*q.v.*). (See Sodii Hypophosphis.) Pil. Phosphori gr. ij.–iv., Oleum Phosphoratum ♏v.–x.

1663. *Therapeutic Uses. Affections of the Nervous System.* The researches of Dr. Broadbent,[3] Ashburton Thompson,[4] Bradley,[5] Routh,[6] Thorowgood, Anstie, and others, leave no doubt as to the occasional utility of phosphorus in this class of cases, especially in those arising from or connected with exhaustion of nerve power induced by mental exertion or excitement. Amongst these may be included various forms of *Neuralgia, complicated with Migraine, Nervous Breakdown from Over-study, Mercurial and other Tremors. Aggravated Hysteria, Epilepsy, Chorea, Locomotor Ataxy, Melancholia*, and *Local Paralytic Manifestations.* The evidence of the value of phosphorus in this class of cases, however, is not very conclusive, and considering the danger of its producing fatty de-

[1] Practitioner, July 1869.
[2] Schmidt, Jahrb, 1867, p. 209.
[3] Practitioner, April 1873.
[4] Practitioner, July 1873.
[5] Edin. Med. Journ. Dec. 1873.
[6] Med. Press, June 3, 1874.

generation of the internal organs, it should only be resorted to after other and safer remedies have been tried, or under special circumstances. Dr. A. Thompson, speaking of its use in neuralgia, places the initial dose at gr. $\frac{1}{18}$ (Dr. Routh says gr. $\frac{1}{30}$), every four hours, for the first six doses: should this afford little or no relief, he directs it to be increased to gr. $\frac{1}{12}$ at similar intervals; if this does not prove effective in forty-eight hours, there is no use in continuing the remedy. The phosphide of zinc promises to supersede phosphorus, as it possesses all its advantages without many of its disadvantages.

1664. *In Impotence*, phosphorus enjoys a long-established repute, and that it does act as a stimulant of the generative organs, especially in the aged, is confirmed by the observations of Dr. Routh, Dr. Ringer (p. 318), and others. According to Dr. A. Thompson, however, it is neither aphrodisiac nor useful in spermatorrhœa, unless given in large and unsafe doses; but that in smaller ones, gr. $\frac{1}{30}$–$\frac{1}{50}$, it will remove the physical and mental debility induced by *Spermatorrhœa*. Dr. Phillips (p. 64) states that he has seen cases of an irritable, weakly condition of the sexual organs, traceable to previous early abuses or subsequent excesses, much benefited by steadily continued doses of gr. $\frac{1}{200}$–$\frac{1}{100}$ thrice daily. It proves specially useful when this condition is connected with *Spinal Irritation*, marked by local discomfort, lumbar pains, sense of fatigue, mental distress, &c. *In Intercostal Neuralgia*, Dr. Phillips (p. 60) speaks confidently of the value of phosphorus in doses of gr. $\frac{1}{100}$–$\frac{1}{30}$, thrice daily. He found it likewise serviceable in relieving the pain of *Herpes zoster*.

1665. *In Essential Anæmia* (*Splenic Leukæmia*), phosphorus has sometimes been administered with success, as, for example, by Dr. Broadbent, where iron had failed; but it has on the whole but few, if any, advantages over arsenic, and its long-continued administration is to be deprecated. (Dr. S. Coupland.[1]) Another case of *Splenic Leukæmia* successfully treated by phosphorus (gr. $\frac{1}{50}$, afterwards increased to gr. $\frac{1}{30}$, thrice daily) is recorded by Dr. Wilson Fox.[2]

1666. *In Chronic Scrofulous Otorrhœa*, Dr. Phillips has found phosphorus very valuable in arresting the discharge, and giving nerve-tone and strength to the system generally; the glycerine of tannin to be used locally at the same time.

1667. *In Chronic Alcoholism*, Dr. D'Ancona[3] regards phosphorus as a valuable remedy. He found it tolerated in far larger doses than those usually employed, being carried to 10 centigrammes—nearly $1\frac{1}{2}$ grains daily, and continued for weeks without injury. He states that the remedy gives to drinkers a feeling of comfort and strength, and furnishes the force necessary to carry on their organic functions, which they have been accustomed to get from alcoholic liquors.

1668. *In Skin Diseases*, Dr. Broadbent[4] is of opinion that if phosphorus was as manageable and as little disagreeable as arsenic, it would be found of superior efficacy to the latter. He relates

[1] Brit. Med. Journ. April 23, 1881.
[2] Lancet, July 10, 1875.
[3] Journ. d'Hygiéne, Feb. 21, 1878.
[4] Lancet, April 22, 1871.

cases of *Eczema* and *Psoriasis* successfully treated by it. In other skin diseases, including *Acne indurata*, *Lupus*, *Scrofuloderma*, and *Pemphigus*, Dr. Eames [1] found phosphorus eminently serviceable. He employed an oily solution (gr. x. in Ol. Olivæ, f℥j.) in doses of ♏v.–x., thrice daily, after meals. On account of its disagreeable acid taste it is best given in capsules. Its effects should be carefully watched, and it should at once be discontinued if it disagrees. Dr. Eames observed that phosphorus produces a coated state of the tongue, not unlike the silvery tongue which follows the prolonged use of arsenic. Cases illustrating the usefulness of phosphorus in *Psoriasis* are recorded by Dr. B. Squire,[2] Dr. Whipham,[3] and others. *In Alopecia*, the local application of a mixture of the tincture (ethereal ?) of phosphorus (℥j.) and castor oil (℥j.) is said to be useful. In addition to the above, phosphorus has from time to time been recommended in *Phthisis*, *Chronic Bronchitis*, *Pneumonia*, *Pleurisy*, *Disorders of Menstruation*, *Exhaustion after Fevers*, &c., *Diarrhœa*, *Rachitis*, *Caries*, &c., but for all these there are equally effectual and more easily managed remedies. *In Cataract*, M. Tavignot [4] has recorded some cases tending to show that, by means of frictions on the forehead with phosphorated oil, and instillation of the same into the eye, the hardened lens or capsule may become absorbed, and restoration of sight established, thus obviating the necessity of an operation.

1669. Acidum Phosphoricum Dilutum. Dilute Phosphoric Acid.

Med. Prop. and Action. Mild tonic and astringent. In large doses, it acts as a stimulant of the nervous and vascular systems; it is absorbed into the system, and has been detected in the blood; it also communicates a peculiar odour to the breath. Dr. Pavy's [5] experiments with this acid, showing that when injected into the duodenum it is capable of inducing a diabetic state of the urine, are both important and interesting.

Dose, ♏x.–xxx., freely diluted in sweetened water.

1670. *Therapeutic Uses. For Scrofula and Scrofulous Affections, especially of the Eye*, dilute phosphoric acid (♏v. gradually increased to ♏xx. or more in infusion of calumba) was brought forward by Mr. Balman as a remedy in no degree inferior to iodine and cod-liver oil. Although experience has not confirmed this estimate of it, it yet fulfils many indications as a grateful, moderately astringent tonic; thus in *Phthisis*, it relieves hoarseness and dry irritating cough accompanied by pain and laryngeal looseness. In the *Dyspepsia of Phthisis* it is also useful, relieving the pain, sickness, and diarrhœa which occur after meals. *Profuse Night Sweats* and other exhausting discharges are controlled by it; and it exerts a sedative effect upon the excessive sexual desire which often develops in some stages of phthisis. (Dr. Phillips, p. 291.)

1671. *In Hæmoptysis*, M. Hoffman [6] reports favourably of this acid (gutt. x.–xxx. in mucilage, thrice daily). He considers it

[1] Dublin Med. Journ. Jan. 1872.
[2] Brit. Med. Journ. Nov. 3, 1877.
[3] Med. Times, Sept. 22, 1877.
[4] Lancet, Jan. 23, 1869.
[5] Guy's Hosp. Reports, 1861, vol. vii.
[6] Practitioner, Aug. 1868.

superior to the other mineral acids. He has also found it useful in *Genito-urinary Catarrh.*

1672. *Calculous Disease.* In phosphatic deposits connected with waste of nervous tissue, and in alkalinity of urine with nerve-depression, phosphoric acid is very useful, and it has relieved the symptoms of *Phosphatic Calculus* and *Urethro-vesical Catarrh*, when nitric and hydrochloric acids had failed. Benefit has also been derived from it in *Oxaluria.* (Dr. Phillips, *op. cit.*)

1673. *In Diabetes*, phosphoric acid, largely diluted, assuages the inordinate thirst so common in this disease, more effectually than any other acidulated drink. (Paris.) In a case recorded by Dr. Thornley,[1] it not only had the effect of allaying the urgent thirst, but acted apparently as a curative agent.

1674. *In Caries*, phosphoric acid, diluted with eight or ten parts of water, was locally applied by Lentin, under the idea that the disease arose from a deficiency of phosphoric acid in the bone. In some instances it appears to have been beneficial. It is also supposed to exert an influence on the growth of *Osseous Tumours.*

1675. PHYSOSTIGMATIS SEMEN. Calabar Bean. Physostigmina, Physostigmine, or Eserine.

Med. Prop. and Action. An energetic poison, long in use amongst the people of Calabar and other parts of Western Africa in their trials by ordeal; hence its name, the *Ordeal Bean of Calabar.* Attention to its physiological effects was first called in this country by Sir R. Christison, who tried it on his own person in a dose of twelve grains: the prominent symptoms were vertigo, a sense of extreme prostration, and syncope, whilst the action of the heart and circulatory system was rendered very weak, tumultuous, and irregular; the mental faculties, however, remaining unimpaired. Subsequently, many cases of poisoning occurred, some of them with fatal results, the principal symptoms in all being, contraction of the pupil, paralysis of the lower extremities, and more or less of other parts of the body, without loss of sensation. Its activity resides in an alkaloid, *Physostigmina* or *Eserina* (Eserine). Dr. Fraser, whose able investigations have thrown much light on the operation of this agent, found that in large doses it causes also nausea, vomiting, and purging, together with a peculiar epigastric sensation which is always relieved by eructation. He likewise observed that it causes excessive perspiration, which is most marked when a large dose is administered by subcutaneous injection. Dr. Fraser gives the following summary of the physiological action of the kernel or embryo of the bean, as observed in the lower animals:—1. It acts on the spinal cord by destroying its power of conducting impressions. 2. This destruction may result in two well-marked and distinct effects: (*a*) In muscular paralysis, extending gradually to the respiratory apparatus, and producing death by asphyxia; (*b*) In a rapid paralysis of the heart, probably due to the extension of this action to the sympathetic system, thus causing death by syncope. 3. A difference in dose is accompanied by this difference in effect. 4. This action does not extend to the brain proper *pari passu* with the action on the spinal cord; the functions of the brain may, however, be influenced secondarily. 5. It also produces paralysis of muscular fibre, striped and unstriped. 6. It acts as an excitant of the secretory system, increasing more especially the action of the alimentary mucous glands. 7. Topical effects follow the local application of various preparations; these are, destruction of the contractility of muscular fibre when applied to the muscles, and contraction of the pupil when applied to the eyeball.

[1] Med. Press, May 20, 1868.

It is chiefly used as a topical agent in ophthalmic surgery. In 1856, Van Hassett found contraction of the pupil to follow the internal administration of the bean; while Dr. Fraser, in 1862, showed that its local application was sufficient to induce this condition. In 1863, Dr. Argyll Robertson further pointed out that the local application of this remedy induced spasm of the accommodation of the eye as well as contraction of the pupil, and was capable of counteracting or modifying the dilatation of pupil and paralysis of accommodation resulting from the application of belladonna or atropine to the eye. Sir W. Bowman further observed a degree of astigmatism, or irregular refraction of the media of the eye, as one of the symptoms. The following are the effects observed upon the application of a drop of a moderately strong solution of the spirituous extract to the conjunctiva of the eye. In the course of about ten minutes the accommodation of the eye becomes affected, objects beyond a few inches from the eye appear dim, enlarged, and close to the eye, while upon the use of a suitable concave glass these symptoms disappear—in fact, a condition of short-sightedness results. At the same time, a sensation of straining is felt in the eye, similar to that experienced after a prolonged near inspection of fine objects. After a short interval the pupil becomes contracted, and this may reach such an extent that the pupil does not measure above one-third of a line in diameter. As a consequence of this contraction, less light is admitted to the retina, and objects appear darker than natural, while the pupil of the other eye becomes sympathetically somewhat dilated. As the effects pass off the affection of the accommodation gradually returns to its normal state; and secondarily, the pupil dilates, and in the course of about twenty-four hours the eye has returned to its natural condition. These symptoms are most readily explained by the supposition that Calabar bean possesses a stimulant action upon the ciliary nerves which are distributed to the circular fibres of the iris, thus causing contraction of the pupil, and to the ciliary muscle, thus causing myopia. The local employment of this agent is beneficial—1st, in cases of paralysis of the circular fibres of the iris and of the accommodation, such as are apt to follow exposure to cold, or to occur in the course of diphtheria, continued fever, or other debilitating diseases; 2nd, to counteract the effects of atropine or belladonna on the eye; 3rd, to diminish the amount of light admitted to the eye in cases of acute inflammation of the choroid or retina; and 4th, in the case of penetrating ulcers or wounds at the peripheral part of the cornea, with the view of preventing or reducing prolapse of the iris. With regard to the antagonism of physostigma and atropine, Mr. Wharton Jones has made observations which tend to show (1) that atropine stimulates the sympathetic and physostigma the third nerve; and (2) that while atropine contracts the arteries, physostigma contracts the veins.

The Antagonism between Physostigma and Chloral, and between it and Atropine, was examined by the Committee of the British Medical Association, and the conclusion come to was, that the antagonism between physostigma and chloral is greater than that between physostigma and atropine, but the whole subject must still be regarded *sub judice*.

In Poisoning by Calabar Bean, the first thing when the poison has been swallowed is to empty the stomach as soon as possible by stomach-pump or strong emetics, to administer atropine hypodermically (gr. $\frac{1}{50}$—$\frac{1}{30}$) till effects are evident, or to give chloral-hydrate in full doses, regulated according to circumstances. In extreme cases, artificial respiration should be employed.

Dose:—Of the Powdered Bean, gr. j., cautiously increased to gr. iij., or at most gr. vj. *Of the Extract*, gr. $\frac{1}{10}$, increased to gr. $\frac{1}{4}$ or more. For dose and mode of administration hypodermically, see sect. 1676. For local application, a solution of the extract in glycerine, of such a strength that one minim contains the active ingredients of gr. iv. of the bean, is most generally employed. *Calabarized Gelatine* is a very convenient and portable form. It consists of thin sheets of gelatine saturated with a spirituous solution of the bean, and marked out into small squares or cut into minute discs, each of which is sufficient for a single application. They are applied by means of a fine moistened

camel-hair pencil to the conjunctiva, where they are dissolved by the tears, and produce their due effect. These gelatine discs have been introduced into the British Pharmacopœia 1885, under the title of Lamellæ Physostigminæ, but no directions for their preparation is given in that work. Each disc is directed to contain gr. $\frac{1}{1000}$ of physostigmine.

1676. *Therapeutic Uses. In Tetanus*, physostigma is a remedy of some value. Dr. Fraser,[1] of Edinburgh, has collected notices of twelve cases in which it has been employed, and the results are, on the whole, encouraging. The extract is the best form for an adult; gr. j. by the stomach, or gr. $\frac{1}{3}$ by subcutaneous injection, will be generally sufficient to commence with, repeated in two hours, when its effects will usually have passed off, and the succeeding doses may be modified according to the experience thus gained. When used hypodermically, the dose of the extract should be carefully mixed with ♏x.–xv. of water, and its acidity neutralized with a solution of carbonate of soda, or which is still better, according to Dr. Haining,[2] with bicarb. of potash. Dr. Ringer advises that the dose should be increased each time it is given, until marked physiological effects are produced. For children, the dose must be regulated according to age, one-third or one-fourth, or even less, of the above dose sufficing. It is necessary to repeat these doses frequently—every hour, every hour and a half, or every two or three hours, according to the severity of the disease. The great object is to produce as quickly as possible, and then to maintain, the physiological effects of the drug in diminishing reflex excitability. The dose must therefore be continued in increasing quantities until this effect is produced, or until its sedative action on the circulation is carried to a dangerous extreme, or until constant nausea and vomiting compel us to desist. Dr. Fraser is in favour of subcutaneous injection, especially in severe cases, but Dr. Eben. Watson, who has had great experience in its use, states that by this mode of application he has failed to obtain any very decided or reliable effect. He prefers prescribing the alcoholic extract in solution as a weak tincture; but should the stomach reject this, he gives a double dose in starch water, in the form of enema. He coincides with Dr. Fraser in the necessity of giving it in large and frequently repeated doses, the sole limit being the complete subsidence of the tetanic spasms, or the development of the poisonous effects of the drug to a dangerous degree. The tolerance of the remedy is wonderful. In one case under Dr. Watson's[3] care, the patient during forty-three days took 1,026 grains of the alcoholic extract, the quantity in one day amounting to 72 grains! In another case, successfully treated by Dr. Haining (*op. cit.*), within a month no less than ten drachms were introduced into the system, chiefly by subcutaneous injection, through 140 punctures made over both arms and shoulders, and over the chest, abdomen, and left thigh! A few small abscesses resulted, but they appear to have been of little consequence. Dr. Watson maintains

[1] Practitioner, Aug. 1868.
[2] Lancet, Dec. 18, 1869.
[3] Practitioner, April 1870.

the safety of a very full and free administration of Calabar bean in traumatic tetanus, if only two conditions be fulfilled—(1) that the patient be well and intelligently watched, so that the drug be given really as often and as much as the patient requires at the time; and (2) that his strength be well supported by fluid nourishment and stimulants. The relaxation produced by the bean enables the patient to swallow fluid food, and therein consists its superiority to all other relaxants, such as chloroform or chloral, for instance, which prevents the taking of food. Dr. H. Wood (p. 326) has collected notices of 60 cases of tetanus, showing 33 recoveries to 27 deaths—not a very flattering record, but, as Dr. Wood points out, allowance must be made for the fact that much of the commercial extract is practically inert, and that in some of the cases probably the remedy did not have a fair trial. Better results might perhaps follow the combined use of physostigma and chloral (*q.v.*).

1677. *In Chorea*, it has been successfully employed by Dr. Harley and Dr. Ogle. Its use is indicated in those cases in which the involuntary contractions demonstrate an exaggerated condition of the reflex motor function of the spinal cord; but, as Dr. Fraser observes, the experience we yet possess is much too limited to allow us to arrive at any decided opinion as to its value. Dr. Ogle mentions a case of *Paralysis Agitans*, in which he gave physostigma in large doses for a long period without benefit. Failure likewise attended its use in *Epilepsy* (12 cases), and in the *Progressive Paralysis of the Insane*, in the hands of Dr. S. W. D. Williams.[1] Dr. W. Munro,[2] however, records several cases of *Tic Douloureux* relieved or cured by introducing within the eyelids of the affected side one or more Calabar gelatine discs, or a few drops of a solution of the extract (1 in 30). No general symptoms were observed in any case.

1678. *In Constipation dependent on Atony of the Intestinal Muscular Fibres*, the extract, in doses of gr. $\frac{1}{8}$ four times daily, continued for a fortnight, was found by Dr. Subbotin[3] to succeed after drastic purgatives had failed. *In Cholera*, Dr. Munro,[4] on theoretical grounds, advocates the subcutaneous injection of the extract. The suggestion is worth bearing in mind.

1679. *In Chronic Bronchitis*, it has been found useful; it seems specially adapted for those cases where expectoration is rendered difficult, apparently by an atonic or relaxed condition of the bronchial muscles. Dr. Subbotin (*op. cit.*) used it with best effects in a case of *Chronic Bronchial Catarrh*, with intense *Dyspnœa*, believed to be due to weakness of the bronchial muscular fibres.

1680. Physostigma prevents *Muscle Wasting*, and hence is given with benefit to *Hemiplegics* and *Paraplegics*. Dr. Ringer recommends gr. $\frac{1}{30}$–$\frac{1}{10}$ of the extract repeated frequently. Further, Drs. Ringer and Murrell[5] give record of various *Diseases of the Nervous*

[1] Practitioner, Feb. 1872.
[2] Brit. Med. Journ. Oct. 31, 1874.
[3] Archiv f. Klin. Med. 1869, p. 285.
[4] Edin. Med. Journ. Oct. 1870.
[5] Lancet, Oct. 2, 1877.

System treated by them with physostigma. They comprised *Locomotor Ataxia, General Paralysis, Paraplegia,* and *Scrivener's Cramp.* The cases of *Paraplegia* were but temporarily benefited.

1681. *Poisoning with Strychnine.* Dr. Fraser has shown that physostigma may be employed as an antidote. But Husemann in his researches on antagonism,[1] although confirming the accuracy of Dr. Fraser's results, shows that chloral is a more efficient drug in dealing with strychnine poisoning.

1682. Eserine, or more properly Physostigmine, which occurs in the form of colourless or pinkish crystals, slightly soluble in water, readily so in alcohol or dilute acids, has superseded the physostigma extract in ophthalmic practice. As a local application, gr. ij. in water ℥j. is about the average strength. For use hypodermically, the dose is gr. $\frac{1}{32}$—$\frac{1}{12}$. *In Glaucoma,* it has been used locally with excellent results, but, as pointed out by Dr. S. Snell,[2] it is more effectual in the acute than in the chronic forms of the disease. *In Weakness of the Ciliary Muscle and consequent Disturbance of Accommodation in Vision,* Dr. Uhthoff[3] shows the value of very dilute solutions of eserine (gr. $\frac{1}{40}$, Aq. ℥j.) thrice daily. Cases of restored power after *Paralysis of the Ciliary Muscle,* by the use of physostigmine, are recorded by Mr. Hutchinson,[4] Mr. Wharton Jones,[5] and Prof. Gübler.[6] The advantage of the use of *Eserine as a preliminary to Extraction in cases of Cataract* is made the subject of some interesting remarks by Dr. C. B. Taylor.[7] *In Scrofulous and other painful Ulcerations of the Cornea,* eserine drops have been found useful.

1683. Picrotoxin. The active principle of Cocculus Indicus, the fruit of an Indian Menisperm—Anamirta, Cocculus W. and A.

Med. Prop. and Uses.—The seeds, used in Ceylon as a means of taking fish, were formerly held in high repute as an insecticide; they are now largely employed for the manufacture of the principle Picrotoxin.

Physiological Action.—On fish the initial action is to produce convulsions, followed by stupefaction. Upon mammals its action is to produce muscular tremors, dulness; later on, convulsions and tetanic spasms. Its behaviour in this respect recalls the phenomena of an epileptiform seizure. Its action is mainly upon the motor centres of the spinal cord, resembling strychnine; in some ways it differs in exciting alternate clonic and tonic spasms and in causing vomiting, as well as in not heighteniug the reflexes. The phenomena of poisoning by cocculus in the human being has lent to it especial importance by the fact that beer and other intoxicants are adulterated by it.

The attack usually commences by vertigo, staggering and inco-ordinate gait. Sweating and gastro-intestinal irritation occur, while in some cases (*Sosinski*) marked epileptiform attacks rapidly followed ingestion of the drug. Death is said to have occurred from failure of respiration and exhaustion. Stillé regards spasmodic seizures as almost always present in poisoning by picrotoxin. Scarlatinoid eruption is sometimes developed (Murrell). Chloral and bromide of potassium are indicated in poisoning by picrotoxin.

[1] Archiv f. Exper. Path. und Pharmacologie, x. 1 and 2.
[2] Brit. Med. Journ. June 3, 1882.
[3] Brit. Med. Journ. July 7, 1883.
[4] Med. Times, Sept. 1864.
[5] Practitioner, Sept. 1869.
[6] Med. Times, 1874.
[7] Brit. Med. Journ. Dec. 30, 1882.

1684. *Therapeutic Uses.* *In Epilepsy and Chorea,* in *Paralysis* of the *Sphincters,* doses of from gr. $\frac{1}{120}$—$\frac{1}{60}$ are recommended by Planat. This commendation, as far as *Epilepsy* is concerned, is not in accord with the observations of Gowers and Ramskill, who confidently affirm that the attacks are aggravated rather than alleviated. Gübler reports a case of *Bulbar Paralysis* which improved under hypodermic injections of gr. $\frac{1}{64}$.

1685. *Dyspepsia, with severe Epigastric Pain,* and when accompanied by *Distension of the Colon with Flatus,* is greatly assuaged by this drug. Dr. Phillips recommends ℥ij.–iij. of a saturated tincture, three times a day, in cases of *Irregular Menstruation,* with paroxysms of severe pain in the hypogastrium shooting to the back and hips. The flow, scanty or pale, is speedily returned to its normal amount and colour under this treatment.

1686. In the *Night Sweating of Phthisis,* Dr. Murrell finds doses gr. $\frac{1}{150}$ form an effectual remedy. He also employed a solution of 1 in 180 (ʒj. to ʒviij. of water). Dose, ʒj. at night.

1687. *In Tinea tonsurans,* a paint composed of Picrotoxin gr. viij., Ac. Acet. Glac., Ol. Ricini āā ʒiv., has been proposed, but it is an ineffectual remedy. For hypodermic injection, an aqueous solution (1 in 240) answers well.

1688. Pilocarpi Foliola. The dried leaflets of Pilocarpus pinnatifolius. Jaborandi. Pilocarpine.

Med. Prop. and Uses. It was first introduced to general notice by Dr. Continho, who had become familiar with its uses in South America, where it enjoyed a high reputation as a diaphoretic, antipyretic, and as an antidote to snake-bites. Its action has been carefully worked out by Ringer, Burdon-Sanderson, Langley, and many others, whose observations are incorporated in the following observations.

The drug takes effect, if swallowed, in ten minutes, or in three, if the alkaloid be subcutaneously injected. There is flushing of the face, profuse perspiration, salivation, with an increased discharge from the nose and eyes. This condition may persist from two to six hours. Diarrhœa may occur, although it is commonly absent. The urine is not affected, but there is great inclination to urinate, with supra-pubic tenderness. This, Ringer believes, is probably due to direct action of the drug upon the bladder muscle, causing it to contract strongly upon its contents. The distress is relieved upon micturition. Vomiting not uncommonly follows, and much prostration may occur, especially if large doses have been given.

The production of salivation and diaphoresis seems to alternate in some persons: where one is marked, the other is slight, and *vice versâ.* Ringer draws attention to the curious tolerance children exhibit towards Jaborandi.

The heart's action is quickened, and the temperature is lowered nearly 1° when diaphoresis occurs.

Upon the eye, pilocarpine produces marked effects. There is contraction of the pupil, tension of the accommodation apparatus, and approximation of the near and far points of vision. Mr. John Tweedy,[1] whose results have been confirmed by Mr. McNaughton Jones, has very fully investigated the matter: he finds impairment of sight occurs, and attributes it to benumbing of the retina. Dr. Wood (531) quotes Galezowski to the effect that pilocarpine (1 in 50) is as efficient as eserine in ophthalmic surgery.

Frontal headache with feeling of distress occur, but soon pass off, when drowsiness replaces them, and a refreshing sleep follows.

[1] Lancet, vol. i. 1875.

The milk glands are excited to increased action, as are also those of the stomach (Pillicier). There is evidence also of abnormal activity of the liver and pancreas.

Physiological antagonism[1] exists between pilocarpine and atropine. If jaborandi is active, it will show its effect at once; so that it is useless to push it if no salivation were to follow an adequate dose.

Jaborandi contains, besides pilocarpine, an alkaloid—Jaborine—whose action is said by Harnack and Meyer[2] to be almost identical with that of atropine. It also contains a volatile oil, and some other inactive constituents. Jaborandi, together with pilocarpine, were introduced into the B. Ph. in 1885.

Dose:—Of the Powdered Leaves, gr. v.–lx. *Of the Extract*, gr. ij.–x. *Of the Infusion* (℥j.–Oj.), ℥j.–ij. *Of the Tincture* (1 in 4), ʒss.–j. *Of Pilocarpine Nitrate*, gr. $\frac{1}{20}$–$\frac{1}{2}$ by mouth, and gr. $\frac{1}{10}$–$\frac{1}{3}$ subcutaneously.

Poisoning by Pilocarpine. Dr. Berkart[3] reports a case which was cured by subcutaneous injection of atropine.

1689. *Therapeutic Uses. In Bright's Disease.* A liquid extract in ℥j. doses, or gr. $\frac{1}{3}$ of pilocarpine hypodermically injected, will determine a full action of the skin, and so relieve the system by taking stress off the diseased kidneys. Its use is indicated in impending uræmic convulsions.

1690. *In Dropsy*, especially that associated with *Bright's Disease*, jaborandi acts rapidly and surely. It drains away an almost incredible quantity of fluid by salivation and perspiration. Its use, however, must be carefully adjusted to the patient's condition, as it may produce much depression and inconvenience.

1691. *Asthma.* Dr. Berkart[4] has employed hypodermic injections of pilocarpine with benefit for asthmatic seizures, and believes that most forms of asthma are relieved by it. Thus in attacks of *Breathlessness* attendant upon *Emphysema* and *Bronchitis, Œdematous and Congested Lungs*, jaborandi is of immense benefit. It is necessary to watch the action, as collapse and other untoward symptoms may in some rare cases supervene upon the employment of this drug.

1692. *To Check Sweating*, Dr. Ringer recommends hypodermic injection of gr. $\frac{1}{20}$ thrice daily, and says it acts certainly in checking sweating. Dr. Murrell has found gr. $\frac{1}{20}$ by mouth very useful in checking *Night Sweating of Phthisis.* In those painful cases of fœtid odour arising from *Sweating Feet*, Dr. Arnimgaud[5] commends hypodermic injections of pilocarpine, gr. $\frac{1}{15}$, repeated daily.

1693. *Exanthemata.* Prof. Gübler, who was one of the first to study the therapeutics of jaborandi, urges the value of it in the acute exanthems. His experience is confirmed by others, who speak very highly of it in *Post-Scarlatinal Nephritis.*

1694. *Puerperal Convulsions* are benefited, at all events in some cases, although the instances in which it has been used are not sufficiently numerous to make any conclusions very reliable.

1695. *In Chest Diseases.* Common *Cold* is well treated by ℥ij.

[1] See Ringer, Practitioner, Jan. 1881; and Journ. Phys. vol. ii. p. 241.

[2] Archiv für Exper. Path. und Pharm. Band xii. p. 366.

[3] Brit. Med. Journ. Jan. 1880.

[4] Brit. Med. Journ. June 1880.

[5] Practitioner, 1881.

doses of the tincture at bedtime, or gr. ss. of pilocarpine. *Pleuro-pneumonia* and *Pleurisy with Effusion* are also benefited. As an ecbolic, jaborandi seems to be of little if any service.

1696. *In Skin Diseases*, pilocarpine injections render the skin supple, and improve its condition. Benefit has followed its use in *Urticaria, Alopecia, Pruritus senilis*, &c.

1697. Professor Laycock[1] published cases of *Diabetes insipidus*, with *Polydipsia*, which he treated with jaborandi, and which were benefited. *Diabetes mellitus* is said also to be improved by a similar treatment.

1698. *Obstinate Hiccough* has been successfully treated with hypodermic injections of gr. $\frac{1}{5}$ pilocarpine.

1699. PINI SYLVESTRIS OLEUM. A colourless, agreeably scented terebinthinate oil, obtained by distillation from the leaves of the Scotch Fir or Pine (Pinus Sylvestris, *Linn.*).

Med. Prop. and Uses. Terebinthinate stimulant, much employed on the Continent, either pure or diluted, as an embrocation in *Chronic Rheumatism;* it is likewise added to warm baths (in proportion of fl3j. or more to a bath) in the same disease, and the painful parts are covered with "fir-wool" prepared from the leaves. This forms part of the pine cure so much in vogue in some parts of the Continent. It is chiefly noticed here on account of its value as an inhalation in *Chronic Laryngitis and other Throat Affections.* Dr. Morell Mackenzie, who speaks highly of it, advises that the oil should be held in suspension in water by means of magnesia, thus:—℞ Ol. Pini Sylvest. ♏xl., Magnes. Carb. levis gr. xx., Aq. ℥j. M. Of this a teaspoonful in a pint of water at 140° is to be inhaled for five minutes night and morning. Six inspirations should be taken in a minute. *In Phthisis*, it might in some cases be advantageously substituted for tar. (See PIX LIQUIDA.) In the B. Ph. 1885, two preparations of fir are introduced: the *Oleum Pini Sylvestris*, and the *Vapor Olei Pini Sylvestris* (oil of fir-wool, ♏xl., light Carb. Magn. gr. xx., water a sufficiency).

1700. *Therapeutic Uses. In Laryngitis, Phthisis* (*v. supra*), inhalations of the vapour have great value.

1701. *In Skin Diseases*, the oil has been employed as a stimulant in much the same cases in which tarry preparations are employed. (See PIX LIQUIDA.)

1702. PIPER NIGRUM. Black Pepper. The dried unripe berries of Piper nigrum, *Linn.*

Med. Prop. and Action. Stimulant and carminative, in doses of gr. v.-x. Much used as a condiment. It contains three active principles—(1) a crystalline principle, Piperine, to which anti-periodic properties have been assigned; (2) a volatile oil, on which the odour and taste of the drug depend; (3) an acrid resin. The hopes once entertained of Piperine in malarial fevers have been falsified; beyond acting as a tonic in *Convalescence* consequent on these and other febrile diseases, it is of little or no use. Externally, ground pepper is irritant, and is occasionally added to sinapisms, to increase their activity. The volatile oil is sometimes employed as a rubefacient. White pepper is merely black pepper deprived of its outer integument.

Dose:—Of Black Pepper, powdered, gr. v.-xx. *Of the Confection*, gr. lx.-cxx. *Of Piperine*, gr. v.-x.-xv., thrice daily.

[1] Lancet, Aug. 1875.

1703. *Therapeutic Uses. In Intermittent Fevers,* pepper bruised and macerated in spirit and water has long been a popular remedy in the East and West Indies. Mild, uncomplicated cases occasionally yield to its use, but most frequently it fails to produce any benefit. It should be given immediately before an expected paroxysm. Dr. Pereira quotes several German authorities, who testify to the febrifuge powers of this remedy.

1704. *In Hæmorrhoids occurring in Old Persons, or proceeding from Debility, and also in a Relaxed Condition of the Rectum, producing occasional Prolapsus,* the administration of the confection in doses of gr. lx.–cxx., persevered in for three or four months, often affords great relief, and sometimes effects a cure. It is only applicable in chronic cases, and in weak leuco-phlegmatic habits. An occasional aperient should be given to prevent its accumulating in the bowels.

1705. *In Cholera,* the natives of India hold in high esteem an infusion of recently roasted black pepper. Dr. Ainslie[1] states that he has known it put a stop to the vomiting when many other remedies had failed. A "cholera pill" popular in Bengal is a combination of powdered pepper (gr. j.), assafœtida (gr. j.), and camphor (gr. ij.) Given early, it is said to be often effectual in arresting the disease.

1706. PISCIDIA ERYTHRINA. Jamaica Logwood. The bark of the Piscidia Erythrina, a leguminous tree, a native of the West Indies.

Med. Prop. and Uses. An active principle, Piscidin, has been prepared; there are, however, other constituents whose nature and properties are hardly known. Wibmer says the natives employ the bark as a means of catching fish. It acts by benumbing and intoxicating them, so that they allow themselves to be snared. It is said to produce a burning sensation in the stomach, with copious sweating, which is followed by sleep.

Dose:—Of the Fluid Extract, ♏xx.–℥ij.

1707. *Therapeutic Uses.* As a sedative in *Delirium* it was used by Dr. Hamilton in 1845, and again by Drs. MacGrath and Scott, for quieting *Mental Excitement* and *Delirium.*

1708. *In Neuralgia,* Dr. Ford[2] has used Jamaica logwood and finds it most successful. He gives it in ℥ij. doses; the first dose is usually successful—it induces sleep, and the patient awakens cured. He speaks highly of it in *Migraine.* In *Neuralgia* due to *Carious Teeth,* piscidia is reputed by some to possess value.

1709. PIX BURGUNDICA. Burgundy Pitch.

Med. Prop. and Action. Burgundy pitch is employed solely as a plaster (Empl. Picis), and as such it acts as a stimulant and rubefacient. It should be evenly spread on a piece of leather, and always be employed fresh. By adopting the usual plan of keeping the pitch in a ladle, and remelting the same portion repeatedly, it loses much of its irritant qualities, and consequently of

[1] Mat. Med. of Hindostan, p. 34. [2] Lond. Med Record, Aug. 1880.

its efficacy. It will remain adherent to the cuticle for several weeks. In some persons it produces an intolerable itching; and in others a pustular eruption, which renders it necessary to remove it in a few hours after its application.

1710. *Therapeutic Uses. In Chronic Coughs, Chronic Bronchitis, and other Pulmonary Affections*, a Burgundy pitch plaster often proves highly serviceable, not only by protecting the chest from feeling the atmospheric changes, but by acting as a rubefacient and counter-irritant. In the first stage of *Phthisis*, Dr. Barlow speaks of the following plaster as a valuable method of counter-irritation:—℞ Emp. Picis Co. ʒjss., Ant. Tart. gr. x.

1711. *In Lumbago and Chronic Rheumatism*, the application of one of these plasters over the seat of pain often proves very beneficial, and affords great comfort to the patient.

1712. Pix Liquida. Tar. A reddish-black bituminous liquid obtained from the wood of Pinus sylvestris.

Med. Prop. and Action. Terebinthinate, stimulant and diuretic. Its effects are very similar to those of turpentine, but it is milder in its operation, and communicates the odour of tar, instead of that of violets, to the urine, assumes a dark colour, and which sometimes contains a black deposit. The vapour, when inhaled, acts as a stimulant and irritant of the lining membrane of the air passages. Tar water is prepared by shaking together one part of tar with four of water. The water takes up the soluble portions of the tar, acquires a pale brown colour and empyreumatic odour. This constituted the far-famed panacea of Bishop Berkeley. Applied externally to ulcers, tar acts as a mild stimulant, and often induces a healthy action. The officinal ointment contains 5 parts of tar to 2 of yellow wax, melted together. Its odour may be in a great measure covered by a few drops of lemon-grass oil (citronella) or by oil of rosemary. Some skins are very intolerant of its action. (See *infra.*)

Dose:—Of Tar, ♏x.–fʒj., or more, in capsules, or made into pills with flour. The dose of *Tar Water* is ʒj.–iv.

1713. *Therapeutic Uses. In Phthisis*, tar vapour diffused through the apartment, by putting some tar on a heated metal plate, or stirring a vessel containing tar with a piece of heated metal, was introduced by Sir A. Crichton in 1817, but from the unfavourable report of Drs. Forbes, Scudamore, &c., it fell into disuse till lately, when attention to it has been called by Dr. Yeo[1] and others, who advocate the treatment of this disease by antiseptic inhalations. It appears, however, to be inferior for this purpose to creasote and carbolic acid. It may prove very serviceable in *Chronic Bronchitis*. It was in this latter that Bishop Berkeley lauded the internal administration of tar-water, and recently Drs. Ringer and Murrell have shown the great benefit to be derived from tar in two-grain doses as a pill, every three or four hours, in that large class of catarrhal and bronchitic affections comprehended under the name of *Winter Cough*. Its efficacy in this class of cases is confirmed by Dr. McCall Anderson.[2] (See Ringer, p. 344.) It certainly merits a careful and extensive trial.

1714. *Habitual Constipation* may often be effectually removed by tar, in doses of gr. v.–x. every night. It requires to be persevered in for some time.

[1] Brit. Med. Journ. July 1, 1882. [2] Brit. Med. Journ. April 24, 1875.

1715. *In Typhoid Fever*, Dr. Chapelle[1] speaks of tar-water as incontestably the most efficacious of remedies. To ʒij. of tar he adds Oij. of boiling water; after it has stood a few hours, the patient commences to drink it, as much at a draught as he can, and filling up with ordinary water, so that the same quantity of tar will last during the whole treatment. He likewise employs injections, prepared by rubbing up the yolk of one or two eggs with a tablespoonful of liquid tar, and adding Oj. of warm water. This serves for two injections, of which six, eight, or even ten, should be administered daily.

1716. *Diseases of the Skin. In Lepra* and *Psoriasis*, tar internally and externally is a remedy of established value. If the eruption be extensive, there is, according to Dr. McCall Anderson, no class of remedies so generally useful as the preparations of tar. However, as he remarks, it is sometimes not well borne; a single application in such cases having been known to aggravate greatly the inflammation of the skin. As there are no means of foretelling in what instances this is likely to occur, it should be commenced cautiously, using at first a diluted preparation in preference to pure tar. When applied to an extensive surface, especially if it be firmly rubbed in on the skin, it is apt to become absorbed into the system, and induce nausea, vomiting, diarrhœa, and feverish symptoms. These symptoms, however, rapidly subside if the treatment be omitted for a few days, and diuretics are administered. Tarry preparations are objectionable for the head, owing to their gluing the hair together; or to the face, owing to the discoloration they produce. Dr. Dyce Duckworth[2] expresses a high opinion of its value in the majority of cases of *Psoriasis*, and advises that it should be applied only to the affected spots, and with as diligent friction as can be borne. "Hebra's Tincture" (Lin. Picis Co.), composed of equal parts of pitch, soft soap, and methylated spirit, is a favourite application. It should be applied with a brush twice daily, allowed to dry on the skin, and washed off with soft soap or petroleum soap. (Neligan, p. 114.) Dr. McCall Anderson bears strong testimony to its value as an internal remedy, having found it succeed when arsenic, &c., have failed. He commences with ɱij. thrice daily, and increases the dose to half a teaspoonful, or more if necessary. The small dose is advisable at first, as in some persons the medicine cannot be tolerated, and produces derangement of the digestive organs, fever, and a bright red rash on the skin. *Eczema*, *Impetigo*, and *Ringworm* sometimes yield to Hebra's tincture (*ante*) or other tarry applications.

1717. *To Indolent and Foul Ulcers* tar ointment (*ut supra*) acts advantageously as a gentle stimulant, induces a healthy action, and hastens the healing process.

[1] Ranking's Abstract, xxiii. p. 23. [2] Lancet, July 4, 1874.

1718. Plumbum. Lead.

The Physiological Effects of the Salts of Lead are thus summed up by Dr. Pereira:—"In small doses they act on the alimentary canal as astringents, checking secretion, and causing constipation. After absorption, the constitutional effects of lead are observed, the arteries become reduced in size and activity, the pulse becomes smaller, and frequently slower also; the temperature of the body is diminished, and sanguineous discharges, whether natural or artificial, are frequently checked, or even completely stopped. This constringing and sedative effect seems extended to the secreting and exhaling vessels; the discharges from the mucous membranes, the exhalations from the skin, and the urine, being diminished in quantity. Thus we observe dryness of the mouth and throat, greater solidity of the alvine secretions, diminution of the bronchial secretion and of cutaneous exhalation. When the system becomes impregnated with the metal, it occasions a peculiar blue or leaden discoloration of the gums, mucous membrane of the mouth, and teeth. Salivation, and a bluish colour of the saliva, have also been observed occasionally. In very large doses, some of the salts of lead, the acetate for example, act as irritant and caustic poisons, giving rise to the usual symptoms indicative of gastro-enteritis."

Poisoning by Lead Salts. Workers in lead, &c., are liable to various ailments grouped under the head of Plumbism. These comprise paralysis of the extensor muscles of the forearm (wrist-drop), griping pains in the intestines (Colica pictonum), and a blue line along the gums (lead-line), &c.

1719. Plumbi Acetas. Acetate of Lead. Sugar of Lead.

Med. Prop. and Action. Internally, it is astringent and sedative; diminishing the secretions. Externally, in solution (gr. xxx.–xl. ad Aq. ʒvj.), it is used as a lotion.

Obs. on its Use. 1. In order to prevent the acetate being converted into a carbonate, it is advisable to combine its use with dilute acetic acid, taken as a draught after each dose of the acetate.

2. It should be given in the form of pill. It is usually combined with opium, an unchemical but efficacious formula. Common water should never be used as a vehicle.

3. It is one of the few astringents admissible during the presence of inflammation. It may be safely administered with opium after depletion.

4. The acid infusion of roses, sulphuric acid, all the sulphates, as of magnesia or alum, as well as the phosphates and carbonates, should be prohibited during its use, as they interfere with its operation.

5. During its administration, if a blue line be observed on the gums (Dr. Burton observed this in one case, after giving five doses of gr. v. each), or if there occur gripings, tightness of the chest, or burning of the stomach, it should be discontinued.

6. The acetate in any form should not be applied to the eye when ulceration of the cornea exists, as it is apt, under such circumstances, to leave an indelible opaque deposit of carbonate of lead in the tissue of the cornea.

Dose:—Of the Acetate, gr. j.–iv. *Of the Pill of Lead and Opium*, gr. iij.–v.

1720. *Therapeutic Uses. Diseases of the Abdomen. In the advanced stages of Acute and in Chronic Dysentery,* acetate of lead (gr. iij.–iv.) in combination with Dover's powder (gr. iv.–v.) often proves highly serviceable, especially when the stools contain much mucus or blood. Though less effectual perhaps than nitrate of silver or sulphate of copper, it possesses the great advantage of being applicable at a much earlier stage than either of these salts, from the comparative mildness of its operation. It may often be advantageously administered in the form of enema:—℞ Plumbi

Acet. gr. x., Acid. Acet. Dil. ♏x., Morphinæ Acet. gr. ¼, Aq. tepid. ℥iv. M.

1721. *In many forms of Diarrhœa*, the acetate proves very effectual. *In the Diarrhœa of Typhoid Fever*, Dr. Harley speaks of it as a very suitable and efficacious remedy; but its continued use, he thinks, should be avoided, as it may subsequently affect the system injuriously. It may be given by mouth, or in the form of enema. *In the Diarrhœa of Typhoid Fever in Children*, Dr. Hillier recommends the acetate in doses of gr. ¼–½. He furnishes the following formula, which is an eligible form of administering this salt, in the *Obstinate Diarrhœa of Children*:—℞ Plumb. Acet. gr. viij., Acid. Acet. Dil. ♏xij., T. Opii ♏viij., Mucilag. Tragacanth ℥ij., Aq. ad ℥ij. M. Dose, two teaspoonfuls for a child two years old. *In the Diarrhœa of Phthisis*, acetate of lead and opium will sometimes succeed even when stronger direct astringents fail.

1722. *In Cholera*, few remedies are more effectual at the outset of the disease in checking the diarrhœa than acetate of lead and opium. Its use, however, is limited to the earliest stages of the attack. Dr. Goodeve prefers administering the acetate in a fluid form:—℞ Plumbi Acet. gr. xxx., Acid. Acet. Dil. ♏x., Aq. Dest. ℥vj. M. Dose, f℥j.–jss., every half hour or hour; opium (gr. j.) to the extent of one or two doses, being given independently. As a general rule, he thinks we should limit the quantity of opium to gr. iij., and the acetate to gr. x.–xv. in the first three hours; and if the disease shows signs of yielding, the doses can be diminished or stopped altogether.

1723. *In Ulcer of the Stomach*, the acetate is often effectual in allaying in a remarkable degree the severity of the symptoms; at the same time it apparently assists in some cases in establishing a healthy state of the ulcerated surface. It is especially useful in controlling *Hæmorrhage from the Stomach*, whether this arises from ulceration or idiopathically. It is best given in doses of gr. ij.–iij., combined with acetate of morphine gr. ¼–½. Thus given it sometimes proves effectual in *Pyrosis*.

1724. *Diseases of the Lungs. In Chronic Bronchitis*, accompanied by profuse secretion of mucus, and in *Bronchorrhœa*, the acetate often proves signally useful. *In Phthisis*, it proves serviceable by diminishing *the Expectoration*, checking the *Hæmorrhage and Diarrhœa*, and in a minor degree the *Profuse Perspirations*.

1725. *In Asthenic Pneumonia*, especially when occurring in debilitated subjects, the acetate is highly recommended by Prof. Christensen; he prescribes it generally with quinine, gr. j. of each, every two hours. If the cough is very violent, opium is substituted for quinine. Its efficacy in pneumonia is further attested by Dr. Strohl.[1] Dr. Bramson has been very successful with it in the *Pneumonia of Children*. Dr. Brandes obtained equally favourable results, and extols particularly its calming properties in this disease. He prescribed it in doses of gr. ss. for children of one to

[1] Practitioner, May 1872.

eight years of age.[1] This treatment is very favourably reported of by Dr. Leudet, of Rouen: out of 40 cases treated by the acetate, 37 recovered and 3 died.

1726. *In Hœmorrhages, active or passive, whether proceeding from the Lungs, the Stomach, the Kidneys, the Nose, or other parts*, the acetate of lead (gr. ij.–iv.), combined with opium (gr. ss.-j.), proves signally useful. The auxiliaries are the external application of cold, acidulated drinks, perfect rest, and antiphlogistic diet. *In Hœmorrhage from the Bowels in Typhoid Fever*, it often proves of great service, especially when given in the form of enema. It has the commendation of Sir W. Jenner.[2]

1727. *Diseases of the Genito-Urinary Organs. In Gonorrhœa, Gleet, and Leucorrhœa*, a solution of the acetate (gr. vj., Aq. ℥j.; vel Liq. Plumb. Subacet. ℥ij., Aq. Oj.) forms a useful sedative injection.

1728. *In Chronic Cystitis*, Sir H. Thompson regards the acetate in the form of injection as perhaps the best mild astringent when the urine is alkaline and depositing phosphates: gr. j. to ℥iv. of warm water, to be used once a day.

1729. *Menorrhagia*, which resists gallic acid and other remedies, will sometimes yield to an enema of the acetate—℞ Plumbi Acet. gr. xv.–xx., Acid. Acet. Dil. ♏xv.–xx., T. Opii ♏xl., Mucilag. f℥ij. M. In mild cases, the combination of the acetate and opium, taken internally, is sometimes effectual. *In Uterine Hœmorrhage, with threatened Abortion*, it is a valuable adjunct to opium when that drug is indicated. (See Opium.)

1730. *Diseases of the Eye.* In the treatment of *Granular Lids, Acute and Chronic Catarrhal Ophthalmia, Scrofulous Affections of the Eye, Vascular Cornea*, &c., the acetate of lead in impalpable powder was employed as a local application with alleged success by Dr. Cunier, of Brussels, and by Dr. Buys.[3] This treatment has been carefully examined by Mr. E. Nettleship,[4] who comes to the conclusion that the use of the powdered salts of lead in the treatment of granular lids should be definitely abandoned, as having no good effect, and often a very bad one. A weak solution (gr. ij. vel Liq. Plumbi Subacet. ♏x.–xv., Aq. Dest. ℥j.) is a very soothing application in mild cases of *Ophthalmia, especially of Children*. It is inadmissible if any corneal ulceration be present.

1731. *In Erysipelas, Urticaria, Lichen, and other Skin Diseases*, the following lotion is favourably spoken of by Sir E. Wilson, as a means of allaying the pain and irritation:—℞ Ammonii Carb., Plumbi. Acet. āā ℥j., Aq. Rosæ ℥viij. M. Ft. lotio. (See also Plumbi Subacetatis Liquor.)

1732. *Toothache*, according to Dr. Reynolds,[5] may be sometimes instantaneously relieved by inserting one or two grains of the acetate into the cavity of a carious tooth. It should not be swallowed.

[1] Ranking's Abstract, 1859, xxx. p. 64.
[2] Lancet, Nov. 15, 1880.
[3] Ranking's Abstract, Dec. 1850.
[4] Brit. and For. Med.-Chir. Rev. Jan. 1875.
[5] Med. Record, Dec. 15, 1870.

1733. PLUMBI IODIDUM. Iodide of Lead.

Med. Prop. and Action. Alterative-tonic, in doses of gr. $\frac{1}{8}$–$\frac{1}{4}$. Rarely administered internally. Chiefly applied externally in the form of ointment or plaster.

1734. *Therapeutic Uses. In Scrofulous Enlargement of the Glands*, MM. Cottereau and De Lisle state that it is the most efficacious of all the salts of iodine; and that it is, moreover, free from the inconvenience of creating cutaneous inflammation. It should be used externally and internally. Occasionally it produces gastric irritation.

1735. *In Chronic Enlargement and other Affections of the Spleen*, Sir R. Martin[1] states that he has derived great benefit from its internal use, and that with it he cured the largest spleen he ever saw in Bengal. He advises the following formula:—℞ Plumb. Iod. gr. xxx., Conf. Ros. q.s. To make one hundred and forty-four pills. Of these, one is to be given night and morning, increasing their number gradually.

1736. *In Porrigo*, Dr. Neligan first employed the ointment with great success. Dr. Mercer considers that its use may advantageously be extended to other skin diseases, and he cites cases of *Chronic Eczema, Erythema*, and *Psoriasis*, in which it was productive of good effects. He regards the officinal ointment as far too strong, and proposes to substitute gr. xij. in place of gr. lxij. to the ℥j. of the diluent. In the case of eczema, the following ointment afforded immediate relief to the intense itching:—℞ Plumb. Iod. gr. xij., Glycerin. f℥j., Chloroform. ♏xl., Ung. ad ℥j. M.

1737. PLUMBI NITRAS. Nitrate of Lead.

Med. Prop. and Action. Astringent. Externally, it is used as an astringent lotion (gr. x.–lx. ad Aq. ℥j.). It is chiefly valuable as a disinfectant.[2] A solution (gr. lx. ad Aq. ℥j.) is said entirely to destroy the effluvium of decaying animal and vegetable substances. This is Ledoyen's Disinfecting Fluid. It is also said to be antiseptic.

Dose, gr. $\frac{1}{4}$-j. in the form of pill, twice or thrice daily.

1738. *Therapeutic Uses. In Hæmoptysis*, Dr. Pereira considers that the action of acetate of lead and opium in these cases is rendered more certain and speedy by being given with a draught containing nitric acid, nitrate of lead being then formed in the stomach.

1739. *To Sore and Fissured Nipples* it has long been an esteemed application. Prof. J. G. Wilson[3] finds nothing so effectual as a solution of the nitrate (gr. x.) in glycerine (f℥j.). It generally causes a sharp smarting pain for a time, but this soon subsides. It should be applied freely to the affected nipple after suckling, and care should be taken to wash the part previous to the next application of the infant. A similar solution proves useful in *Chapped Lips and Hands.*

[1] Johnson's Tropical Climates, 6th ed. p. 299.

[2] Dublin Journ. Med. Sci. May 1882.

[3] Glasgow Med. Journ. May 1869.

1740. *In Onychia*, to destroy the sanious fungous ulcers, Dr. De Moerloose[1] speaks highly of the local employment of the powdered nitrate. A single application every twenty-four hours suffices, a light bandage being applied in the interval. After the first application the pain is stated to cease, the suppuration to be lessened, and the fœtid odour destroyed. Prof. Vanzetti of Padua (cited by Sir W. Mac Cormac[2]) employed it in twelve cases with complete success when all other remedies had failed; and its efficacy is further attested by Mr. Fairlie Clarke,[3] Mr. Howard Marsh,[4] and others.

PLUMBI OLEAS. (See OLEIC ACID.)

1741. PLUMBI OXIDUM. Oxide of Lead. Lithargyrum.

Med. Prop. and Action. Imperfectly known; it is not administered internally; it is the chief ingredient in Emplast. Plumbi, used in surgical practice as a support to weak parts, strapping, &c. It is an ingredient in many officinal plasters and ointments.

1742. *Therapeutic Uses. Carbuncle.* "In local treatment one of the best things you can do, if the carbuncle is small, is to cover it with Empl. Plumbi spread upon leather, with a hole in the middle through which the pus can exude, and the slough can come away. That, occasionally changed, is all the covering a small carbuncle will need. It is, however, difficult thus to cover the whole surface of a large carbuncle, and to keep it clean (which is of the greatest importance), and therefore the best application for that is the common resin cerate, which should be spread large enough to cover the whole carbuncle, and over it should be laid a poultice of half linseed-meal and half bread." (Sir James Paget.[5])

1743. PLUMBI SUBACETATIS LIQUOR. Solution of Subacetate of Lead. Subacetate of Lead dissolved in water. (Goulard's Extract.) PLUMBI SUBACETATIS LIQUOR DILUTUS. Diluted Solution of Subacetate of Lead.

Med. Prop. and Action. Mildly astringent and sedative, applied externally in the form of lotion (j.–ij. ad Aq. Oj.) or ointment (Sol. of Subacetate f℥vj., Camphor gr. lx., White Wax ℥viij., Oil of Almonds Oj.) Glycerinum Plumbi Subacetatis (B. Ph. 1885), Ung. Glycerin. Plumbi Subacetat. (B. Ph. 1885). Not prescribed internally.

1744. *Therapeutic Uses. In the Acute Pain occasioned by the presence of a Stone in the Bladder*, Dr. Prout states that he has seen great temporary relief produced by a lotion composed of Liq. Plumb. Subacet. Dil. and T. Opii in equal parts, applied as hot as possible, by means of a sponge, to the perinæum. Opium or other remedies, as indicated in each case, may be given internally at the same time. *In Prostatorrhœa*, Prof. Gross[6] recommends the following injection:—℞ Liq. Plumbi Subacet., Vin. Opii āā ℥j., Aq. ℥x. M. To be used thrice daily.

1745. *Syphilitic Warts and Vegetations*, when small and sessile,

[1] Rev. de Thérap. Méd. Oct. 1868.
[2] Brit. Med. Journ. Dec. 6, 1873.
[3] Lancet, May 23, 1874.
[4] Brit. Med. Journ. Jan. 17, 1874.
[5] Lancet, Jan. 16, 1869.
[6] North Amer. Med.-Chir. Rev. July 1860

often wither slowly and painlessly under the daily application (by means of a camel-hair brush) of Liq. Plumbi Subacet. Strict cleanliness is essential. (Hill and Cooper, p. 590.) Small *Nævi Materni* have been successfully treated by the same remedy kept constantly applied by means of a compress.

1746. *In Pruritus Pudendi*, the following is a very soothing application:—℞ Liq. Plumb. Subacet. f℥j., T. Hyos. f℥ij., Mist. Camph. f℥viij. M. It should be applied tepid. Rest and strict antiphlogistic regimen should be enforced. It proves very useful in other forms of *Pruritus*. According to Dr. Cameron[1] its efficacy is increased by its combination with milk (1 to 4). *In the Vulvitis of Children*, the constant application of cloths saturated with a tepid lotion containing this solution, is often attended with excellent effects. *To Painful Piles*, Dr. Graves advises the following lotion:—℞ Liq. Plumb. Subacet. Dil. ℥vj., Spt. Rosmar., T. Opii āā ℥j. M. To be applied five or six times daily.

1747. *Many Skin Diseases*, especially *Eczema* and *Impetigo*, when attended with heat and pain, are much benefited by the local application of an ointment composed of ℥j. of liquor plumbi and lard, or, better still, "cold cream," ℥j. It should be spread on lint, and the whole covered with an emollient poultice. The glycerole of the subacetate of lead is highly spoken of by Dr. B. Squire[2] in the treatment of *Chronic Eczema*.

1748. *To Inflamed and Erysipelatous surfaces, Ecthyma, Onychia, Chilblains, Inflamed Glands, painful Bruises, Sprains*, &c., the diluted solution, kept constantly applied to the parts, is a soothing application. *To Indolent and Ill-conditioned Ulcers* it may also be applied with advantage. *To Chapped Hands and Lips* it proves very serviceable.

1749. Podophylli Rhizoma. Podophyllum Rhizome. The dried rhizome and rootlets of Podophyllum peltatum, *Linn.* Podophylli Resina. A resin obtained from Podophyllum by exhausting with rectified spirit and percolation.

Med. Prop. and Action. Purgative, approximating to scammony and jalap in its operation. Its alleged cholagogue properties have been the subject of much difference of opinion, but these may be partially if not completely reconciled by the following words of Dr. Rutherford.[3] "The resin," he says, "is a very powerful hepatic stimulant." Its effects on the intestinal mucosa is so irritating that it seems feasible to regard it as contra-indicated in cases where there is a tendency to irritation of that membrane. If the dose be too large and violent, purgative action ensues, the secretion of bile, so far from being increased, is diminished. With a smaller but still too strongly purgative dose, "the bile-secretion, though it may be powerfully raised for a short time, quickly falls as the substance passes down the intestine, and induces increased secretion from the Lieberkühn's glands. With somewhat smaller doses the increased bile secretion is much more prolonged, although the hepatic excitement is not so intense at the outset as in the preceding case." The inferences from this are—(1) that to obtain the cholagogue effects of podophyllin, it must be given in small doses; and (2) that these are materially

[1] Dublin Journ. Med. Sci. June 1882.
[2] Med. Times, March 18 and 25, 1876.
[3] Practitioner, Nov. 1879.

diminished or destroyed when the dose is sufficiently large to produce hypercatharsis. The main drawbacks to podophyllin as a purgative are the great uncertainty which attends its operation, requiring its combination with other purgatives, and its tendency to cause griping, &c. From the recorded experience of American physicians the following points seem to be established:—1. That the purified resin of podophyllum is escharotic, producing, when applied to the skin, small pustules, which are difficult to heal; and when administered internally, giving rise to extreme griping and violent catharsis. 2. That chloride of sodium given with podophyllin increases its purgative action to an undesirable extent, and should therefore be avoided, except in cold phlegmatic habits, where the action of the drug is feeble. 3. That lactic acid counteracts its operation, and that sugar, sweetmeats, pickles, and like substances should be avoided when it is administered. On the other hand, many writers recommend it to be well triturated with four or five times its weight of fine sugar. 4. That its use should be avoided in inflammatory states of the stomach and bowels, particularly of the mucous lining of the primæ viæ. 5. That a warm infusion of ginger is the best means of relieving tormina and griping caused by its use. 6. That for an over-dose, sour milk, whey, or any form of lactic acid, are the best remedies. Lastly, that, as a purgative, bitartrate of potash (gr. xx.–xxx.) is the best adjuvant; whilst, when given as a cholagogue or alterative, it is well to combine it with small doses of belladonna, hyoscyamus, or cannabis indica. In some cases, a kind of ptyalism has been observed to follow its continued use. Mr. Hugh Norris states that he has observed it produce emmenagogue, in addition to its purgative effects. Its emmenagogue action is likewise noticed by Dr. Tilt, who advises its exhibition with aloes when the object is to promote menstruation.

Dose:—Of the Resin, gr. $\frac{1}{4}$–j. in the form of pill, as a purgative. To obtain its cholagogue effects gr. $\frac{1}{8}$–$\frac{1}{4}$, twice or thrice daily. *Of the Tincture* (B. Ph. 1885), ♏xv.–ʒj. According to Dr. Dobell,[1] all the accidents and inconveniences attendant on the use of podophyllin may be obviated by giving it in solution, instead of in the form of pill, as is commonly done. Given as follows, he regards it as the most satisfactory and reliable of medicines:—℞ Podophyll. Resin. gr. ij., Ess. Zingib. ʒij., Spt. Vini Rect. ad ʒj. A teaspoonful to be taken in a wineglassful of water every night at bedtime, or every second, third, or fourth night as required. Dr. Ringer (p. 444) also suggests a solution (gr. j. Spirit Rect. ʒij.) of which the dose is ♏iij.–vj. for adults, ♏j.–ij. for children.

1750. *Therapeutic Uses. In Liver Affections*, podophyllin in small doses seems particularly indicated. *In Engorgement of the Liver*, and in *Torpor of the Liver occurring in old residents in Tropical Climes*, Dr. Gardner speaks favourably of its action. In these cases it often does not act for ten or twelve, or even in some cases for sixteen or twenty hours, the purging appearing to result from the large amount of bile thrown into the bowels. Dr. Murchison,[2] in a paper on *Functional Derangements of the Liver*, speaks of podophyllin as a good substitute for mercury when from any cause this is contra-indicated. In all cases where it is desirable to evacuate or stimulate the liver, as in *Fevers*, *Bronchitis*, *Headache*, &c., Dr. Gardner states that he has used podophyllin with highly satisfactory results. Dr. Ringer speaks of it as very useful in some forms of *Sick Headache* (*Migraine*), in doses of ♏ij.–iij. of the above-named solution, thrice daily. He also reports favourably of it in some forms of *Chronic Diarrhœa*, *Dyspepsia*, &c.

[1] Brit. Med. Journ. June 14, 1879. [2] Brit. Med. Journ. May 2, 1874.

1751. *In Constipation*, without other disorder, Dr. Gardner usually prescribes gr. $\frac{1}{8}$–$\frac{1}{4}$ in a pill with Pil. Rhei Co. It acts, he remarks, very much the same as we expect a grain of calomel or five grains of blue pill with the compound rhubarb pill to act, and he considers that in very numerous cases it may be substituted for mercurials with great advantage. *In the Constipation of Phthisis*, often depending upon fatty degeneration of the liver, it has been resorted to with the best effects, and notwithstanding the length of period which elapses before it operates, with a marked degree of benefit not obtainable from any other purgative.

1752. *In Gout*, when it is often an important point of treatment to secure free biliary evacuations, Dr. Gardner employs with good effect podophyllin in the form of pill, with henbane or belladonna, which latter medicines modify its operation. The same treatment has been adopted in *Acute Rheumatism*.

1753. Potassa Caustica. Caustic Potash. Hydrate of Potash. Called also Potassæ Hydras.

Med. Prop. and Action. Powerful caustic and escharotic; taken into the stomach, it acts as a corrosive poison. It is never prescribed internally. One of its chief medicinal uses is in making issues, but the rapidity with which it deliquesces is a great objection to its use. It readily attracts moisture from the atmosphere, and should therefore be kept in closely-stoppered bottles. The mixture of equal parts of caustic potash and lime (Potassa cum Calce) is also caustic, and is preferable from its being less deliquescent. It is used in the form of paste made with spirit.

1754. *Therapeutic Uses.* These are very limited at the present day. It has enjoyed some repute as a caustic application in *Hospital Gangrene*, *Uterine Ulceration*, *Stricture of the Urethra*, and some *Skin Diseases*, especially in *Eczema;* but in these it has been superseded by other more effective and more manageable agents. Mr. Wardrop advocated its use for the destruction of superficial *Nævi Materni*. Comparing it with nitric acid in these cases, Mr. T. Holmes[1] remarks that it penetrates deeper than the acid, and is therefore applicable to the treatment of the thicker nævi, but it is much more painful, and leaves a more evident scar. Dr. J. Murray[2] reports highly of it as a local application in *Carbuncle*.

1755. Potassa Sulphurata. Sulphurated Potash. Hepar Sulphuris.

Med. Prop. and Action. Stimulant, diaphoretic, and expectorant; it increases the force and frequency of the pulse, and the action of various secreting organs. It requires to be commenced in small doses, and cautiously increased. In large doses it is poisonous. Its chief use is as an external application, in solution (℥j.–ij., ad Aq. Oj.), or in the form of ointment (gr. xxx. ad Ung. ℥j.). Its action is impaired by keeping. The sulphuretted bath is prepared by dissolving Sulphurated Potash (or Soda) ℥iij., Carbonate of Sodium ℥ij., Chloride of Sodium ℥ij., and Sulphate of Sodium, ℥j. in Distilled Water Oj. Add this to 20 gallons of water at 98° F.

Dose, gr. iij.–vj. in pill.

[1] Dublin Quart. Journ. Aug. 1869. [2] Glasgow Med. Journ. Nov. 1870.

1756. *Therapeutic Uses.* *In Dyspepsia*, when the mucous follicles are supposed to be implicated, much benefit will be derived from the exhibition of this salt in doses of gr. x., either alone or combined with some aromatic. It has been thought to exercise a specific action upon the gastric mucous follicles.

1757. *In Scabies*, sulphurated potash is an efficacious remedy. The following mode of application, adopted by Alibert, &c., has met with great success :—In one bottle is placed a solution of the sulphuret (℥j. ad Aq. Oij.); in another bottle is placed ℥ij. of dilute sulphuric acid. At the time of the application the patient places a glassful of each in a basin of hot water, and washes the parts affected for half an hour, morning and evening. It has not a very strong odour, and does not stain the linen—two great advantages. The liniment of Jadelot is composed thus :—℞ Potass. Sulphuret. ij., Sapon. Alb. lb. j., Ol. Papav. lb. ij., Ol. Thymi, ℥j. This forms an ointment which may be employed twice a day. Valentin's liniment is equally efficacious, and less irritating :—℞ Pot. Sulphuret. ℥j., Ol. Amygd. ℥j., Camphor. gr. xx. M. By the use of these a complete cure is effected in less than fourteen days.

1758. *In Acne Simplex*, the local application of a solution has been advised (Potas. Sulphuret. ℥j., Aq. Oj.) twice a day; or, which is more effectual, a sulphuretted bath (℥iv. ad Aq. Occ.) *In Ringworm*, a lotion composed of Potas. Sulph. gr. lx.-cxx., Aq. Calcis lb. j., has sometimes proved serviceable. Dr. B. Squire (Syst. v. p. 983) speaks favourably of the sulphuret in these cases, and considers that it imparts tonicity to the shaft of the hair, which is important when epilation becomes necessary, and that at the same time it penetrates the substance of the hair, and destroys the parasite. *In Sycosis*, Duparc advises that the pustules should be painted, night and morning, with a concentrated solution of sulphurated potash. It is said to be efficacious. It has also been successfully used as a lotion in *Tinea capitis*, *Eczema*, *Lepra*, &c.

1759. *In Lead Poisoning*, the sulphuretted bath is one of the most effectual remedies we possess.

1760. *In Chorea*, good results are claimed to have followed from baths, each containing ℥iv. of this salt: in eight cases thus treated, five derived decided benefit. Of fifty-seven cases treated with these baths by Sée, fifty were cured in an average of twenty-two days.

1761. POTASSÆ LIQUOR. Solution of Potash.

Med. Prop. and Action. Antacid, blood-alterant, and diuretic. Dr. Parkes has shown that the action of liquor potassæ on healthy subjects varies according to whether it be taken before or after meals. If taken after meals, it acts as an antacid; it combines with the hydrochloric acid, and passes into the circulation without increasing the water, the solids, or the sulphuric acid of the urine. If liquor potassæ and other alkaline preparations, administered soon after meals, do not appear in the urine, we may conclude that they improve digestion and the condition of the blood. Dr. Parkes and Dr. K. Chambers have shown that when liquor potassæ is taken before meals it has the power of reducing obesity. From thirty to ninety minutes after the liquor potassæ has entered the circulation, there is an increased flow of slightly

acid urine, which contains the whole of the potash and organic matter, and a relatively large proportion of sulphuric acid. In other words, an albuminous compound, either in the blood itself or in the textures, becomes oxidized; its sulphur, under the form of sulphuric acid, unites with the potash, and possibly with the changed proteid compound, and is eliminated by the kidneys. The amount of albumen or fibrin thus destroyed by a few doses of liquor potassæ is doubtless small; but as the remedy can be taken for a considerable time, and its oxidizing effects can be assisted by exercise, and by copious draughts of water, there is a possibility of removing superfluous matter from a patient (*vide infra*). Continued for too long a period, it is apt to induce a cachectic condition of the system. As it possesses the power of impairing or destroying the activity of henbane, belladonna, and stramonium, they should not be prescribed together.

Dose, ɱxv.–lx., freely diluted. Milk is a good vehicle, or a little liquorice effectually disguises its taste.

1762. *Therapeutic Uses. In Scrofula*, liquor potassæ was formerly held in high repute, and though not deserving of the encomiums passed upon it by Brandish, Farr, and others, it appears in some instances to be productive of good. According to Dr. Ranking,[1] given in doses of ɱxxx.–lx. thrice daily, it occasionally produces a rapid diminution of glandular tumours, but it does not appear to have the least effect in correcting the scrofulous diathesis. Dr. Campbell, in his work on Consumption (Lond. 1841), brought forward liq. potassæ as a remedy for *Phthisis;* but Dr. Cotton,[2] after a fair trial with it, states that it is rarely productive of any good. It cannot compare in efficacy to cod-liver oil.

1763. *In Chronic Bronchitis, Bronchial Congestion*, and *the advanced stages of Pneumonia*, when the sputa is scanty, thick, and viscid, the addition of ɱx.–xv. of liquor potassæ to an ordinary expectorant mixture is often attended with good effect. Dr. Walshe praises it in *Plastic Bronchitis*. Alkaline baths, conjointly used, prove useful.

1764. *In Calculous Affections, and in some Diseases of the Bladder, when the Urine is acid, and there is much Irritability of the Urinary Organs*, liq. potassæ, in doses of ʒss., combined with laudanum, is productive of much benefit. Owing, however, to the small quantity of potash which we may venture to exhibit in the caustic state, the urine is not rendered alkaline by this remedy so speedily as when the tartrate or citrate of the base is used. *In Chronic Cystitis*, when the urine is acid, Sir H. Thompson speaks highly of a combination of Liq. Potassæ and T. Hyoscyami. *Ardor Urinæ, attendant on Gonorrhœa*, or arising from other causes, is greatly relieved by the addition of liq. potassæ to mucilaginous drinks, &c.

1765. *Acidity of the Stomach, Cardialgia, and many Anomalous Affections arising from this cause*, will often yield rapidly to liq. potassæ, in doses of ɱx.–xv., in milk or mild bitter infusion. Its effect is not so transitory as that of the carbonated alkalies.

1766. *In Acute Rheumatism*, the internal exhibition of liquor potassæ has been favourably noticed by Sir T. Watson and others; but it possesses no advantage over the bicarbonate of potash (*q.v.*),

[1] Trans. of Lugol, p. 244. [2] Med. Times, April 13, 1861.

which, from the mildness of its operation, is preferable in most cases. Fomentations of the affected joints with a diluted solution (℥j.–iv., Aq. Oj.) have been recommended. *In Gout*, it often proves a valuable adjunct to colchicum.

1767. *In Obesity*, the use of potash internally was introduced by Dr. Flemyng in his work on Corpulency in 1760, and more recently its claims as a reducer of fat have been advocated by Dr. Chambers, Dr. Neligan, and others; but, as Dr. Ringer (p. 195) justly observes, "to diminish fatness in a way so likely to damage health, and even to endanger life, is surely a mistake." "Though occasionally successful," he adds, "this treatment generally fails signally." The dose of liq. potassæ employed by Dr. Chambers commenced at ℥ss., and was gradually increased to ℥j.–jss. thrice daily in milk. A rigidly low diet and active exercise were at the same time enjoined.

1768. *In Mammary Tumours* (*Indurations of the Breast*) *simulating Cancer*, Sir J. Paget[1] advocates covering the hardened and adjacent parts with a belladonna plaster, and giving internally ℥j. of liq. potassæ, and gr. ij. of iodide of potassium thrice daily, after meals, in not less than four ounces of any simple liquid. (For his remarks on the belladonna plaster see Atropa Belladonna, sect. 409.) Of the curative influence of the liq. potassæ, he considers there is sufficient evidence. He states that he has seen so many instances of induration of the mammary gland disappearing during its use, that after allowing all that can reasonably be claimed for the belief that it might have disappeared, even though no treatment had been used, there would remain facts enough to justify the belief in its efficacy; and this gains some confirmation from the reputation that liq. potassæ once enjoyed in curing *Cancer*. In this latter, Sir James continues, he has given it very often, and never saw reason to believe that it had any other influence than that of amending some of the conditions such as lithiasis, with which it was associated. In the reputed cures, he believes indurations of the breast, such as he has been speaking of, were mistaken for cancer. Dr. Seymour, in his work on Ovarian Diseases (1830), called attention to the value of liq. potassæ in *Ovarian Tumours*.

1769. *Diseases of the Skin*. *In Lepra* and *Psoriasis*, especially when occurring in gouty subjects, or when much acidity of the stomach co-exists, liquor potassæ, ♏xv.–xxx. thrice daily, is a remedy of considerable value. *In Eczema*, under the same conditions, it proves valuable: it may also be used as an external application. Dr. McCall Anderson recommends the eruption to be painted with liquor potassæ night and morning by means of a large brush. Excessive smarting may be relieved by the application of cold water. *In Ephelis* or *Freckles*, arising from exposure to the sun, Dr. Todd advises the following lotion:—℞ Liq. Potassæ ℥j., Aq. Rosæ ℥ij. M. Ft. lotio. *In Acne*, its internal use is favourably spoken of by Mr. Milton, especially if there is much thickening of the skin. Although he regards it as inferior to arsenic, he believes that in time it will produce considerable absorption of

[1] St. Barth.'s Hosp. Rep. 1878.

the matter around the follicles, making the skin much thinner and softer, and sometimes also paler.

1770. *To Ingrowing Nail,* Mr. Norton, of St. Mary's Hospital, has found the painful operation of evulsion in all cases avoided by the local application of diluted liq. potassæ (℥ij., Aq. ℥j.). A piece of cotton-wool saturated with this solution is pressed gently down between the upper surface of the nail and the soft tissues, which latter are generally in the form of a fungous mass of granulations. The solution permeates the substance of the nail, and softens and pulpifies the superficial cells. The wool is kept continually moist with the lotion, and the softened nail-tissue is wiped away each morning. The nail in a few days becomes thin and flexible, and if desired can be pared away without pain, or it may be allowed to remain for a few days longer, when it becomes entirely removed by the solution. It is essential that the lotion be continued until all ulceration has disappeared, otherwise the too early hardening of the epithelium becomes again a source of irritation, and promotes a return of the disease, or rather prevents a cure from being effected. This treatment appears well worthy of trial.

1771. POTASSII ACETAS. Acetate of Potassium.

Med. Prop. and Action. In doses of gr. x.-lx. it is an efficient and mild diuretic; in doses of gr. cxx.-ccxl. it acts as a purgative; but in the latter character it is inferior to other saline purgatives, as it causes much griping and flatulence. When administered in continuous doses, it is absorbed into the system, undergoes decomposition in the blood, and appears in the urine in the form of carbonate, rendering that secretion alkaline, and generally producing an increase in its quantity. From Dr. Nunneley's[1] experiments with the citrate and acetate of potash on himself, he concludes that they only slightly increase the quantity of water excreted by the kidneys, whilst they distinctly lessen the amount both of the urea and solids excreted. Its diuretic effect is increased by giving it largely diluted. It should be kept in well-stoppered bottles.

1772. *Therapeutic Uses. In Dropsical Affections, Œdema, Anasarca,* &c., acetate of potash, largely diluted, often proves useful as a diuretic. For this purpose it may be combined with squill, digitalis, and other remedies of the same class. It should not be given in larger doses than gr. xxx. every three or four hours, or it may act as a purgative, and pass off by the bowels.

1773. *In Gastro-intestinal Affections, especially in Chronic Catarrhal Conditions of the Gastro-intestinal Mucous Membranes* the acetate is supposed by M. Marotte[2] to exercise a special influence in arresting or diminishing the excessive mucous secretion. He calls special attention to the anti-emetic qualities of this salt, though in real inflammatory states it appears rather to excite than diminish vomiting.

1774. *In Acute Rheumatism, Skin Diseases,* and *Chronic Enlargement of the Glands, and other Organs,* the acetate is occasionally employed on account of its alkaline alterant effects upon the

[1] Med.-Chir. Trans. liii. p. 36. [2] Practitioner, Jan. 1869.

blood and secretions. Sometimes it is used as an *anti-lithic*, on account of its power of rendering the urine capable of holding uric acid in solution. (Garrod, p. 128.)

1775. Potassii Bicarbonas. Bicarbonate of Potassium.

Med. Prop. and Action. Antacid and diuretic. In its operation it closely resembles the carbonate, but is milder in its action, and from its less disagreeable taste its use is more generally available. The experiments of Dr. Ralfe[1] tend to establish the fact that the administration of this and other alkaline bicarbonates on an empty stomach increases the acidity of the system, whilst their administration after a meal diminishes it. Its action as a diuretic is increased by copious dilution. It is frequently used in the form of effervescing draughts (gr. xx. of the bicarbonate saturates gr. xiv. of citric acid, gr. xv. of tartaric acid, or ʒiijss. of lemon-juice).

Dose, gr. x.-xxx. It should be freely diluted.

1776. *Therapeutic Uses. In Acute Rheumatism*, the alkaline plan of treatment advocated by Dr. Garrod consists in administering a dilute solution of this salt, gr. xxx. every four hours, until the joint symptoms and febrile disturbance have completely disappeared. These doses produce no inconvenience either to the stomach or bowels; the urinary secretion is not notably increased, but its character is completely altered, and the reaction becomes either neutral or alkaline; it usually remains clear, but occasionally there is a deposit of the triple phosphates. Upon the heart the alkaline bicarbonate acts as a sedative, reducing the frequency of the pulse, sometimes forty-eight beats in the minute, but not causing any faintness. When a patient is fully under its influence, the blood is distinctly altered, and the coagulation of the fibrine takes place more slowly. Dr. Fuller, who advocates a mixed form of treatment, bears strong testimony to the value of alkalies in this disease, and considers that ʒjss. is the minimum dose of an alkaline carbonate which will suffice to overcome the acid condition of the blood during the first twenty-four or forty-eight hours of treatment, and in sthenic cases ʒij. are often needed. Small doses he regards as useless. Alkaline baths (lb. j. of carb. of potash or soda to a bath) are often of great service in *Rheumatic Gout* and *Chronic Rheumatism*. The salicin and salicylic acid treatment of acute rheumatism has, however, practically superseded all other methods, including the alkaline.

1777. *Dyspepsia, attended with Acidity of the Stomach, Cardialgia, &c.* In cases of acid dyspepsia arising from the excessive formation of acid within the system, as in lithæmia, the alkaline bicarbonates should be administered *after* food. On the other hand, when the free acid is formed in the stomach itself, the result of fermentative changes of undigested food, &c., they should be given before meals. The abnormal acidity being thus removed, digestion can be properly performed. (Ralfe.)

For other Therapeutic Uses, see Potassii Carbonas.

[1] Med. Times, vol. liii. p. 31.

1778. Potassii Bromidum. Bromide of Potassium.

Med. Prop. and Action. Sedative, anaphrodisiac, and antispasmodic. When administered internally, it is absorbed into the system, and has been detected in the blood, also in the urine, milk, and perspiration. Its *mode of action* is yet undetermined. It appears certain—(1) that even when taken for a long period and in large doses it does not lessen the force or frequency of the normal pulse; (2) that, taken in health, it does not reduce the temperature of the body below the normal standard, but where there is slight pyrexia a diminution of the abnormal temperature has been observed; (3) that in therapeutic doses it does not notably affect any of the secretions—occasionally the amount of urinary water is increased; (4) that it does not interfere with the reproductive functions of either sex; (5) that in very rare cases by moderate doses, and in a larger number of cases by greater quantities, it induces *Bromism* (*v.* Bromine). Its long-continued use is apt to produce in some constitutions mental disturbance, stupor, confusion of ideas, impotence, and acneiform eruption, all of which, however, disappear on the discontinuance of the remedy. This eruption occurs more frequently in young children than in adults. In some cases where it has been long continued without evidencing any physiological effects, it seems to accumulate in the system and suddenly to manifest all the symptoms of bromism. Its action is apparently directed mainly or chiefly upon the system of vaso-motor nerves, and it acts upon that system as a sedative. (Dr. Russell Reynolds.)[1] As an anaphrodisiac its powers are unequivocal. It is perhaps one of the most powerful agents of that class. It also exerts an anæsthetic influence over the mucous membranes generally, but especially over those of the pharynx and larynx—a circumstance which has been taken advantage of in preparing patients for laryngoscopic examinations and operations. As an instance of its power to produce anæsthesia of a mucous surface, M. Riemslagh cites the case of a man whose eyes had been injured by the discharge of a pistol. Under the use of the bromide, the insensibility of the conjunctiva became so perfect that the membrane was partially removed, and particles of powder, &c., extracted from the sclerotic itself, without the least manifestation of pain. To obtain this effect, it requires to be given in large doses (gr. xv.–xxx.), in two or three doses, at intervals of an hour. Some persons whilst taking it experience a peculiar dryness of the throat and neighbouring parts. Externally, it is applied in the form of ointment (gr. xx.-cxx., Adipis ʒj.).

The comparative properties of the Bromides of Potassium, Sodium, and Ammonium have been examined by MM. Chévron and Fouques,[2] who arrived at the following conclusions:—(1) These salts, in virtue of their bromine, act as moderators of the reflex centres. (2) The potassium bromide joins to its sedative action on the nervous centres a depressing action on the muscular system; it is thus a neuro-muscular agent. (3) The sodium bromide acts likewise on the nervous centres, but does not affect the muscular system; hence it is simply a moderator of reflex action. (4) The ammonium bromide exercises the same sedative influence on the nervous centres as the other two, while it is, in virtue of its ammonia, an excitant and stimulant; it is thus at once a moderator of reflex action and a peripheral excitant. Consequently, when it is desired to influence the reflex powers and the muscular system, the potassium bromide is indicated; if the reflex centres alone, the sodium bromide; if, leaving the muscular system out of consideration, it is desired to act on the nervous centres, to restrain the circulation, and to effect a diminution in blood pressure, the ammonium bromide will most probably give the required result. Dr. Ringer[3] made some careful researches on this subject, and has proved that the potassium salt acts very prejudicially upon the heart and tissues in general: he recommends the sodium salt as far preferable.

Dose, gr. v.–xxx. in solution.

[1] Practitioner, July 1868.
[2] Glasgow Med. Journ. Oct. 1882.
[3] Med.-Chir. Trans. 1882.

1779. *Therapeutic Uses. Diseases of the Nervous System. In Epilepsy*, the bromide takes precedence of all other remedies; it absolutely cures very many, and it rarely fails to diminish notably the number of attacks in those whom it does not cure. It is most successful in recent cases, but it is also of service in those of long standing, and it most certainly is as useful in those cases where the fits are frequent and severe, as it is in others where they are of rare occurrence and of milder type. In some rare instances, however, it fails, but these should not be allowed to detract from the reputation of so useful a medicine. The cases most benefited by it are those in which the attacks are of the severer type—*le haut mal*—in which the rate of recurrence has been rapid, and in which the fits have occurred mainly in the day; whilst those which have resisted its action have been marked by a predominance of slight or abortive seizures—*le petit mal*—or have exhibited the severer attacks at rare intervals, or have suffered from them only during the night. (Dr. Russell Reynolds.) The commencing dose may be gr. x.–xv. thrice daily, but it may often be increased to double or even treble this quantity with safety and advantage. In all cases it is worthy of a fair trial. *In Epilepsy connected with Syphilitic Disease of the Brain*, Hill and Cooper (p. 443) speak of the bromide as specially useful, given thus:—℞ Potass. Bromid. gr. x., Potass. Iod. gr. v., Ammon. Carb. gr. v., Sp. Chloroform ℥x., Aq. ʒj. M. To be taken three or four times a day in water.

1780. *Epileptiform Convulsions*, occurring during the course of chronic or acute disease of the brain, are often completely removed by the bromide, the other symptoms of such diseases being in some cases relieved, in some removed, in others unaffected, *Convulsions not epileptiform* are sometimes benefited, but not with the same uniformity as the former. *Hysterical Convulsions and Spasms* are slightly influenced by the bromide; and the same may be said of *Chorea*, though cases are recorded in which it appeared to act beneficially: in some, it is apparently prejudicial. (Dr. Russell Reynolds.) In some cases of *Chorea*, in which it was tried by Dr. Ramskill, it proved a failure; and its effects were found only transitory by Dr. Anstie.[1]

1781. *In Tetanus*, the bromide, from its physiological action, is seemingly the best indicated of all remedies, but clinical experience is not as yet sufficient to enable us to come to a definite conclusion regarding it. Thus speaks Dr. H. Wood (p. 336), who furnishes a table of twenty-four cases treated with it, showing only three deaths, which is very encouraging. He considers that not less than ʒss. of the salt should be given in the day, and that chloral as a hypnotic should be given at night.

1782. *In Insanity*, for the purpose of allaying maniacal excitement, Dr. Clouston[2] insists strongly on the value of a combination of the bromide with tincture of cannabis indica. He found it more uniform, certain, and lasting in its effects than any other remedy. The usual dose was ʒj. of each of the ingredients, repeated

[1] Practitioner, June 1874. [2] Brit. and For. Med.-Chir. Rev. Jan. 1871.

thrice daily, and continued for weeks or even months, which may be done with safety. In some cases of *Acute Mania* the excitement was subdued in a few days by the combined medicines; and in some cases of *Periodic Mania* and *General Paralysis* it proved effectual in subduing the worst symptoms of maniacal excitement. In one of the latter it was continued for nine months with the best effects. One case of *Senile Mania* was successfully treated by it. The milder cases of *Puerperal* and *Climacteric Insanity* were sometimes remarkably benefited by ʒj. doses of the bromide at night.

1783. *In Sleeplessness*, the bromide often exerts remarkable power, especially in that arising from over-taxed mental energy or emotion. When opium and other narcotics, observes Dr. Begbie,[1] have failed to procure sleep, or when they have succeeded only at the expense of sickness, headache, &c., the bromide will often tranquillize, and secure repose. In the sleeplessness which occurs during *convalescence from fever*, and at the termination of acute diseases, or after surgical operations, the bromide will be found safe and efficacious; gr. xx.–xxx. in ʒjss. of water, or orange-flower water, at bedtime, repeated in the morning, and then persevered in for days or weeks, will often effect what the most powerful narcotics have failed to accomplish. Combined with chloral (āā gr. xv.) it sometimes succeeds in inducing sleep when it has failed in large doses given singly. It may also be advantageously combined with henbane or Indian hemp.

1784. *In Delirium Tremens*, the bromide is often of conspicuous benefit by removing the delusion, by calming the delirium, and by procuring sleep. Its usefulness is most apparent in the earlier stages of the disease, before the delirium has become furious; and is also of very great service in removing any delusions that may remain after the attack has been partially subdued; gr. xx.–xxx., or even more, may be given every two hours till sleep ensues. (Dr. Ringer, p. 165.) Dr. G. W. Balfour[2] bears strong testimony to its value: he regards the cases in which it fails as exceptional, and in some of these failures the cure was completed by the subcutaneous injection of morphia. It acts best when stimulants are withheld; the cases in which they were given proved tedious and unsatisfactory.

1785. *In the Convulsions of Childhood*, which recur once every day, every other day, or once a week, the cause being obscure, unassociated with debility, teething, &c., Dr. Hughlings-Jackson[3] advises the bromide in doses of gr. ¼ for a child under six weeks of age; gr. ss. under three months; gr. j. above that age, and gr. j. additional for every year. The bromide, he adds, is a most useful drug in *Chronic Convulsions from any cause*, and in most cases, excepting temporary and acute states like anæmia, it should be prescribed when other remedies fail, whatever is the state of the child. *In the Restlessness and Nerve-irritation or Convulsion*

[1] Edin. Med. Journ. Dec. 1, 1866.
[2] Lancet, Feb. 1, 1879.
[3] Reynolds's System of Med. ii. p. 240.

sometimes attendant on Dentition, the bromides are so exceedingly useful, according to Dr. Phillips (p. 141), that the gum lancet is scarcely ever needed. *In Puerperal Convulsions*, Dr. R. Barnes prescribes in the intervals between the fits, when the patient can swallow, the bromide of potassium or of ammonium in doses of gr. xx.–xxx. every three or four hours, premising a dose of chloral (*q. v.*).

1786. *Vertigo*, especially when it occurs paroxysmally, without the co-existence of obvious spasm or organic disease of the brain, often yields to the bromide; and *Headache* of a paroxysmal character, with heat of the head and flushing of the face, is often rapidly relieved by it. (Reynolds.) *In Nervous or Sick Headache* the bromide (gr. v.–x.–xxx.) combined with Spt. Ammon. Arom. (ʒss.) may often be given with great advantage. (Dr. Latham.[2])

1787. *Some forms of Neuralgia* are effectually relieved by full doses of the bromide when other remedies have failed. It also in many instances relieves the pain and irritability of *Chronic Arthritis*.

1788. *In Hysteria*, it is occasionally useful as a sedative. It was first employed in this class of cases by Sir C. Locock.[3] A case of *Hysterical Dysphagia* benefited by it is mentioned by Dr. J. Turnbull, who has published some valuable remarks on this drug in nervous affections.[4]

1789. *Disturbances of the Vaso-motor System* in other parts of the body than the head (epilepsy, vertigo, &c.) The symptoms of these disturbances or changes vary much according to the regions affected. Such symptoms are, for example, *sudden numbness, coldness, deadness, or pricking sensations in one or more limbs; sudden distressing but undefinable feelings in the abdomen, epigastrium, or hypogastrium;* or *sensations akin to rigor, with much "anxiety" and palpitation or "fluttering" of the heart.* In such cases it may be observed that the local circulation is interfered with—*e.g.*, the pulse in one arm becomes faltering, irregular in force and rhythm, occasionally intermitting, while that in the other arm may remain unaltered, and the beat of the heart may maintain its normal character. These distressing symptoms may often be diminished or entirely removed by the bromide, gr. v.–x. twice or thrice daily. (Dr. Russell Reynolds.)

1790. *In Affections of the Genito-urinary Organs*, the bromide exercises special influence as a sedative; hence it has been employed with satisfactory results in *Nymphomania*, *Priapism*, and some forms of *Spermatorrhœa*. *In Gonorrhœa*, M. Riemslagh[5] found the bromide an effectual cure in doses of gr. xv.–xxx., taken in two or three doses at intervals of an hour. It effectually relieved the *Chordee* in these cases. Its efficacy is extolled by Dr. J. W. Bligh,[6] who, in addition to its internal use (gr. xv. twice daily), prescribes it as an injection: ℞ Potass. Bromid. ʒii., Glycerini ʒss.,

[1] Obstet. Journ. July 1873.
[2] Brit. Med. Journ. March 30, 1872.
[3] Lancet, May 1857.
[4] Liverpool Med. Surg. Rep. Oct. 1868.
[5] Med. Circular, Oct. 15, 1862.
[6] Practitioner,, Feb. 1874.

Aq. ad ℥vi. M.; one syringeful being used every four hours. He states that gr. xxx. at bedtime will almost certainly relieve *Chordee*. His estimate of it is very high. *Pruritus Vulvæ* sometimes yields to it, given internally and applied locally.

1791. *In Menorrhagia*, it is a remedy of considerable power. The rules which should guide us in its administration are thus laid down by Dr. Ringer:—If the loss of blood occurs only at the natural menstrual period, it will be sufficient to begin the medicine about a week before the discharge is expected, and when this has for a time ceased it should be discontinued till the next attack is about to begin. If, on the other hand, the loss of blood occurs every fortnight, or oftener, it should be given without any intermission till the disease is well controlled; and when the discharge has been brought to its right period and amount, a few doses should be given for a short time before each monthly period. Dr. Meadows[1] considers that it has more power than any other remedy in controlling *Ovarian Menorrhagia*. Over *Uterine Hæmorrhage*, due to tumours of the uterus, it has less control than ergot and other remedies.

1792. *In Fibrous Tumours of the Uterus*, Dr. Graily Hewitt (p. 558) speaks favourably of a conjoined use of bromide and iodine; gr. x. of the bromide being taken internally twice or thrice daily, whilst iodide of potassium ointment is applied over the lower part of the abdomen. At the same time, other measures, baths, &c., should not be omitted. Dr. A. R. Simpson[2] considers that though the bromide possesses no power as a solvent of uterine myomata, it is of value in modifying the conditions that favour their development. When practicable, the mineral waters of Kreuznach should be resorted to.

1793. *In the Vomiting of Pregnancy*, the bromide (gr. xv.–xx. every two or three hours) has proved successful in the hands of Drs. Packard and Hickson.[3]

1794. *In Diabetes*, Dr. A. Flint[4] employed the bromide (gr. xv.–xx. thrice daily), conjoined with the ordinary diabetic diet, in three cases with very encouraging results. M. Felizet[5] believes that it possesses a curative power in this disease, and this belief, he states, is based on the result of clinical and experimental researches.

1795. From the observations of Dr. Da Costa,[6] it appears that the bromide exercises a marked influence in *correcting or preventing the unpleasant effects produced by Opium and its Salts*.

1796. *In Spasmodic Asthma*, in two long-standing cases which had resisted all ordinary remedies, Dr. Begbie obtained excellent results from full doses of the bromide night and morning. In two other cases, in adults, it failed in the hands of Herr Sondahl[7]; but it proved eminently successful in a case of *Spasmodic Asthma of Childhood*, after all manner of narcotics, expectorants, and anti-

[1] Brit. Med. Journ. July 12, 1879.
[2] Edin. Med. Journ. Jan. 1878.
[3] Practitioner, Sept. 1868.
[4] Amer. Practitioner, Jan. 1870.
[5] Lancet, Sept. 22, 1883.
[6] Amer. Journ. Med. Sci. April 1870, and April 1871.
[7] Practitioner, Feb. 1869.

spasmodics had failed. It was given in gr. vj. doses, in syrup, every two hours.

1797. *In Laryngismus Stridulus* and *Spasmodic Croup*, it has been employed, at Dr. Begbie's suggestion, and in some cases with manifest advantage. As a local application in croup, a solution of the bromide, in an atomized state, was first employed by Dr. Schwitzler, and reported favourably of. Dr. Beigel[1] also tried it (gr. x., Aq. ℥j.) in an early stage of the attack, and found the symptoms arrested. It should be applied in the form of spray by means of a suitable apparatus.

1798. *In Hooping-cough*, Dr. Begbie states that he has found the bromide to possess powers not inferior to any narcotic in subduing the nervous element which forms so conspicuous a part of its phenomena. It appears to be successful in proportion as the affection is simple and uncomplicated. It is chiefly adapted to the advanced stages of the affection.

1799. *The Spasmodic Affections of the Bowels, and Colic of Infancy and Childhood*, will, according to Dr. Ringer (p. 160), mostly yield at once to the bromide. He also has found it effectual in the *Nightmare* of children as well as of adults.

1800. *In Enlargements of the Spleen*, Dr. R. Williams[2] was the first to introduce the use of bromide, and he details four cases successfully treated with it. Its efficacy in *Malarial Splenic Enlargements* is further attested by Dr. C. Bernard,[3] who carried it to the extent of gr. xx.–xlv. daily. Dr. Phillips (p. 152) confirms the statement of Sir Spencer Wells as to the value of the bromide in the *Splenic Enlargements of Children:* dose, gr. iij., raised to gr. v. or more, thrice daily. *In Malarial Enlargements of the Liver* it has also been found serviceable.

1801. *In Painful Hæmorrhoidal Affections, Fissures of the Anus*, &c., M. Ferrand[4] has found compresses saturated with a solution of the bromide (4 parts) in glycerine (20 parts), locally applied, give immediate relief. In fine powder it has been advantageously applied to *Indolent Ulcerations*, and it was thus successfully used in a case of *Epithelioma* by Dr. Perrant.[5]

1802. *In Scrofulous Eruptions and Ulcerations*, the bromide, internally, has been found serviceable in allaying pruritus, &c.; but as a general remedy in *Scrofula* it is inferior to iodine and cod-liver oil. Dr. Garrod substituted it for the iodide with complete success in *Syphilitic Psoriasis and other Syphilitic Eruptions*. In persistent *Urticaria*, occurring independently of local causes or constitutional derangement, Dr. M'Call Anderson[6] advises the bromide in full doses.

1803. Amongst other diseases in which it has been employed are *Diabetes and Cholera* (Begbie), *Amenorrhœa and Hypertrophy of the Ventricles* (Magendie), *Carbuncle* (Bennett), and *Incontinence of Urine in Children* (Hewson); but evidence of its utility is incon-

[1] Practitioner, Aug. 1868.
[2] Elements of Med. p. 366.
[3] Bull. Gén. de Thérap. 1874.
[4] Practitioner, Aug. 1868.
[5] Med. Times, 1876. vol. ii. p. 368.
[6] Lancet, March 19, 1870.

clusive. The bromide is apparently deserving of more attention than has been awarded to it in *Inflammatory and Painful Affections of the Eye.*

1804. *In Strychnine Poisoning,* "Dr. Saisson has demonstrated its value by experiments on animals; and Dr. C. B. Gillespie and Dr. C. L. Bard have each reported recovery under its use, without vomiting, after the ingestion of three grains of the alkaloid." (Dr. H. Wood, p. 337.) The action of strychnine and the bromide is thus apparently directly antagonistic.

1805. Potassii Carbonas. Carbonate of Potassium.

Med. Prop. and Action. Antacid and diuretic. Its action resembles that of liquor potassæ, but it is less caustic, and therefore can be administered in larger quantities. Milk is a good vehicle for its exhibition, as it disguises its taste. Its diuretic effect is greatly increased by the use of diluents, and by a combination with other diuretics. It passes through the kidneys unchanged. It is frequently used in the form of effervescing draughts, thus—gr. xx. of the carbonate saturates gr. xvij. of citric acid, gr. xviij. of tartaric acid, or ʒiv. of lemon-juice. The salt requires to be kept in well-stoppered bottles, as it deliquesces on exposure to the air. The ill effects of its long-continued use are the same as those of Liquor Potassæ (*q.v.*).

Dose, gr. x.–xxx. freely diluted.

1806. *Therapeutic Uses. In Calculous Affections,* when the urine has an acid reaction, alkalies are indicated. Of these, Dr. Roberts regards the potash carbonate as the most potent solvent of uric acid, acting much more rapidly than either the soda or lithia salt. This point is disputed by Dr. Garrod, who places it between lithia and soda, giving the former the higher place. (See Lithiæ Carb.) The intense pain attendant on the presence of stone in the bladder is often strikingly relieved by this and the other alkalies. It may be given in doses of gr. x.–xxx. in mucilage, with fʒj.–jss. of tincture of hyoscyamus.

1807. *In Skin Diseases attended with Acrid, Acid Discharge,* a lotion of the bicarbonate (gr. xxx.–lx., Aq. Oj.) is often very effectual in allaying the irritation. *In the Chronic Forms of Eczema, Herpes, and Pityriasis,* Neligan employed with advantage an ointment composed of Potass. Carb. gr. xx. and Lard ʒj., smeared over the eruption at night and washed off with a solution of the carbonate (ʒss., Aq. Oj.) in the morning. The "soft soap" and "green soap," so much in vogue on the Continent in the treatment of skin diseases, doubtless owe much of their efficiency to this potash ingredient. (See also Potassæ Liquor and Sodii Carb.)

1808. *In Buzzing in the Ears, &c., produced by Accumulations of Hardened Wax in the External Meatus,* the ears may be syringed with a solution of Potassii Carb. (gr. iij.–xx. ad Aq. ʒj.), and stopped at night with cotton, in order that a portion of the liquid may be retained.

1809. Potassii Chloras. Chlorate of Potassium.

Med. Prop. and Action. Refrigerant, diuretic and antiseptic. Its operation on the system is ill understood. It was formerly thought that it acted by

imparting oxygen to the system; but Wöhler obtained it in an unchanged state in the urine of a person who had taken it, showing that it undergoes no chemical change in passing through the system. It certainly increases at times the flow of urine and saliva, and is eliminated unchanged in all the secretions, since Isambert [1] found it in the tears, the bile, the nasal mucus, the perspiration, and even in the milk of nursing women. It escapes freely through the kidneys, but both Isambert and Laboide [2] noticed that it appears in the saliva before the urine. Isambert, from experiments on himself, found that when taken in large doses (ʒij.–v. daily) it caused salivation, free diuresis, increase of the appetite, and, when not well diluted, gastric irritation. The urine continued strongly acid, and contained an excess of uric acid and the urates. Injected in large doses into the veins of an animal, it produces sudden cardiac paralysis. (Wood.)

Dose, gr. x.–xxx. in solution. *Trochisci.* Each contains gr. v. In ordering this salt in the form of powder, we must remember that it explodes when rubbed up with organic substances or with sulphur. (Binz.)

1810. *Therapeutic Uses. In Continued and Typhoid Fevers*, Sir T. Watson stated that his fever patients were given ʒj. of this salt dissolved in Oj. of water as a daily drink, and that it appears to exercise a favourable influence upon the general character and course of the disorder. *In Scarlet Fever*, he employed this drink with manifest advantage. Under its use, the tongue, from being furred and brown or dry, becomes clean and moist. *In Anasarca supervening on Fever*, it often proves very serviceable.

1811. *In Ulcerative and Gangrenous Stomatitis* (*Cancrum Oris*), no internal remedy is more generally effectual than the chlorate, in daily doses of gr. v.–xx. for children and gr. xx.–xxx. for adults. *In Ulcerative Stomatitis*, Dr. West states that he relies upon it almost exclusively, and that there seems to be no form nor any stage of the affection in which it is not useful. Marked improvement seldom fails to be observed in two or three days, and within ten days a cure is generally effected: gr. iij. in sweetened water every four hours suffice for a child æt. 3 years; gr. v. every four hours appear to answer as well as a larger dose for a child æt. 8 or 9 years. The bowels require to be regulated and the constitution supported. *Inflammation of the Gums arising from Teething* will, according to Dr. West, generally yield to the chlorate, gr. ij. every four hours for a child æt. 1 year. *In severe cases of Thrush*, if the breath be fœtid and there be much swelling of the lips and gums, the chlorate should be given freely (gr. iii.–v., Aq. ʒiv., every 4 hours). In cases inclining to be chronic this also makes a very good wash for the mouth. (Dr. Squarey.)

1812. *In Diphtheria*, the chlorate in full doses, combined with Liq. Cinchonæ, seems in some cases to be of service, though not so obviously so as in ulcerative stomatitis. A strong solution may be used as a gargle. Dr. Squire finds that when there is much tenacious secretion, the chlorate in coarse powder, or small crystals of it, may be taken into the mouth from time to time with benefit. *In Croup*, after the operation of an emetic, the chlorate, in doses

[1] Gaz. Méd. 1874, p. 562.

[2] Bull. de Thérap. lxxxvii. p. 251.

of gr. v. every three or four hours, freely diluted in milk or water, has been recommended.

1813. *Phagedænic and Unhealthy Ulcerations*, whether of a *Syphilitic*, *Scrofulous*, or *Cancerous* origin, often improve under the chlorate given internally in doses of gr. xx.–xxx., in Decoct. Cinchon. (ʒj.–ij.) thrice daily. The local application of the chlorate is also stated to yield excellent results: finely powdered, it should be thickly dusted over the ulcerated surface, previously well cleansed, and allowed to remain on until the next dressing. It may be repeated twice daily, the surface being cleansed before each application. This treatment is said to relieve the pain, change the character of the morbid process, to promote healing, and to have the further merit of safety.[1] With regard to its local use in *Cancerous Sores*, Dr. Burrow[2] commences with the salt in fine powder and covering the whole with a wet compress, and when sensibility becomes abated he replaces the powder with the crystals, which exert a very powerful action and excite greater pain. He considers that he has seen cures effected by it thus employed.

1814. *In Chronic Mucous Diarrhœa*, with whitish, greyish, or mucilage-like stools, arising from the absence of bile, &c., Copland used to recommend it with Pulv. Tragac. Co. and aromatics. *In Infantile Cholera*, when it passes into a dysenteric state, when the exhaustion is great and the stools offensive, he also administered the chlorate in the same combination with advantage. *In Chronic or Asthenic Jaundice*, accompanied by a torpid state of the liver, he also advises the chlorate, which may in this case be advantageously conjoined with the carbonate of sodium or with other substances.

1815. *In Chronic Bronchitis*, particularly when it occurs in persons advanced in life, and in children when it has assumed a chronic form after hooping-cough, or the exanthemata, benefit occasionally accrues from the internal exhibition of the chlorate of potash, in doses for adults of from gr. ij.–vj. three or four times a day.

1816. *In Phthisis*, the chlorate has been advised on theoretical grounds, and has been favourably spoken of by Dr. Symonds[3] and others; but no reliance is to be placed upon it excepting as a palliative of certain symptoms or conditions, especially the *Soreness or Rawness of the Tongue and Painful Deglutition in advanced cases*. Here Dr. D. Powell[4] derived the greatest benefit from the following:—℞ Potas. Chlor. gr. xl.–lx., Glycerini fʒss., Morphinæ gr. jss.–ij., Syrup ad fʒiv. M. A teaspoonful swallowed slowly acts locally on the parts affected and relieves the cough.

1817. *In Catarrh*, Dr. L. Sedgwick[5] speaks highly of the chlorate: he says it quickly relieves stuffing of the nose, hoarseness, &c., and

[1] Practitioner, Sept. 1882, p. 215.
[2] Lancet, April 12, 1873.
[3] Brit. Med. Journ. June 13, 1868.
[4] Lancet, Dec. 19, 1868.
[5] Brit. Med. Journ. vol. i. 1873.

that taken early and frequently it will often arrest a cold. From 8 to 10 lozenges may be taken daily.

1818. *In Chronic Cystitis*, when the urine is putrid, Dr. Braxton Hicks found great benefit from injections into the bladder of a solution of the chlorate (gr. iv.–v. ad Aq. ℥j.).

1819. *For the Relief of Photophobia in Scrofulous* (?) *Ophthalmia*, when the disease of the eye has been supplemented with a turgid mucous membrane within the nose, and thickening of the upper lip, Mr. B. Vernon[1] states that he has found the chlorate in large doses a most useful medicine.

1820. *Salivation.* The earlier symptoms are best relieved by discontinuing the mercury, giving a smart purge of colocynth and sulphate of magnesia followed by chlorate of potash, thus:— ℞ Potass. Chlor. gr. xv.–xx., Acid. Hydrochlor. Dil., Spt. Chloroform. āā ♏x., Infus. Cinchonæ ℥j. M. Chlorate of potash lozenges or tablets may be advantageously used at the same time. (Hill and Cooper.)

1821. *Toothache dependent on Caries* is sometimes relieved by the introduction of a moist crystal of the chlorate into the cavity of the tooth. (Binz.) *In Ozœna*, it surpasses all other topical remedies in efficacy and pleasantness. (Ibid.)

1822. Potassii Citras. Citrate of Potassium.

Med. Prop. and Therap. Uses. The citrate acts mildly on the skin, bowels and kidneys, and promotes their secretions. It is an excellent refrigerant soothing or sedative diaphoretic in *Fevers*, and is less apt to act upon the bowels than the acetate or tartrate. It is particularly valuable when the stomach is irritable; and when there is a tendency to diarrhœa it may be advantageously combined with an opiate, unless otherwise contra-indicated. This, in common with other vegetable salts of potash, when taken internally, becomes absorbed and decomposed in the system, appearing in the urine in the form of a carbonate. According to Nunneley[2] it slightly increases the quantity of water excreted by the kidneys, and lessens the amount both of urea and solids excreted. Valuable antiscorbutic properties have been assigned to it by Dr. Palmer[3] and others. It proves very serviceable in affections connected with *Lithiasis. In Temporary Disturbance of the Digestive Organs, accompanied by Irritation of the Urinary Passages from Crystalline Deposit of Uric Acid*, this potash citrate requires to be taken only for a few days; but in cases of *Gravel* and *Renal Calculus* it is only after steady perseverance in it for some weeks that any remedial influence can be expected. (Dr. Basham.[4]) In *Acute Cystitis*, Dr. G. Johnson[5] advises that the urine should be kept neutralized by the citrate given every six hours.

Dose, gr. xx.-lx.

Potassii Hypophosphis. See Sodii Hypophosphis.

1823. Potassii Iodidum. Iodide of Potassium.

Med. Prop. and Action are closely analogous to those of iodine (*q.v.*). M. Dorvault, who has examined closely the action and properties of the iodides, observes, that if the animal fluids (blood, lymph, semen, and milk), or their

[1] St. Barth.'s Hosp. Rep. 1877, p. 172.
[2] Med.-Chir. Trans. liii. p. 36.
[3] Pharm. Journ. July 1, 1871.
[4] Practitioner, Nov. 1870.
[5] Brit. Med. Journ. May 31, 1873.

proteid elements (albumen, fibrin, and casein) be subjected to the action of a solution of iodide of potassium, it will be seen to prevent their coagulation, and will dissolve them. In producing this effect, the salt remains unaltered; it acts, therefore, by what chemists have called the catalytic force. The same result may be shown to have been obtained when employed in certain pathological cases. The salt may be detected unaltered in the blood, or urine, or other secretions. These facts have been observed by many other investigators, and all have found practically that the iodide of potassium promotes secretion, and increases the function of the mucous glands of the alimentary canal, of the liver, kidneys, skin, pancreas, parotid, &c. It is rapidly eliminated from the animal fluids. Dr. Scharlau found that a patient, to whom he gave 53 grammes daily, eliminated 51 by his urine; the other two by the saliva, sweat, and tears. Dr. Kramer satisfied himself by his experiments, that six days sufficed for the complete elimination of this salt after its exhibition during fifty days. *As a lactifuge*, the iodide is stated by M. Rousset[1] to prove very effectual. In order to obtain this effect, it requires to be given in full doses, within the first or second day after delivery. The dose has been a matter of dispute; some exhibiting it in very small quantities (gr. ij.–iij.), whilst others have given as much as gr. lx. or even gr. cxx. for a dose. Dr. Barclay[2] found the powers of the iodide greatly intensified by combination with chloral, and he gives a series of cases in which this combination in small doses induced iodism in 10 out of 15 patients, after the first or second dose of the mixture. On the other hand, carbonate of ammonia is thought to delay or prevent iodism. Further remarks on the dose, and the combinations which are supposed to increase the efficacy of the iodide, will be found in art. Syphilis (*infra*). Opium appears to interfere considerably with the development of its action. Externally, it may be advantageously applied in the form of ointment, which is mildly stimulant, discolours the skin, and in some instances causes much irritation; it should be used freshly prepared, as if kept long it is apt to spoil. (See also IODUM.)

Dose, gr. ij.-xx. in solution. Prep. for external use: *Ointment. Liniment of Iod. of Potassium and Soap.*

1824. *Therapeutic Uses. In Scrofula and Scrofulous Affections*, the iodide, given uncombined with other remedies, does not appear to exercise any great influence; but when conjoined with iodine, it is essentially useful, apparently increasing the activity of the latter remedy, in addition to rendering it more easily soluble. It should be employed both externally and internally. Lugol found that baths, holding in solution the iodide alone, produced no sensible effect on the skin, or on the constitution. Given in combination with quinine, it often proves most serviceable in *Scrofulous Ophthalmia.*

1825. *In Chronic Hydrocephalus*, the iodide internally, and iodine lotions to the scalp, have been advocated by Trousseau, and, when more active measures may not appear justifiable, some hope in the way of arrest of the further progress of the disease may be entertained from the use of these remedies. Great additional assistance is derivable from the syrup of iodide of iron, cod-liver oil, and bone-earth. (Dr. Ramskill, ii. p. 404.) In the acute form, when the disease is declared, the iodide is recommended by Dr. Hillier (p. 172), the other measures being ice or cold lotions to the the head, mercurial aperients, and absolute rest in a quiet darkened

[1] Gaz. Hebd. de Méd. Sept. 17, 1858. [2] Lancet, Sept. 21, 1872.

room. It may be given to young children, in doses of gr. j. every four hours. Dr. Coldstream[1] bears witness to its value in subduing the symptoms indicative of a tendency to hydrocephalus, especially when occurring in scrofulous subjects. *In the Convulsions attendant on Dentition*, which, amongst ill-fed children, are often followed by hydrocephalus, he found great advantage from its use. He gave gr. ss.–iij. every three or four hours in some carminative water; blisters to the scalp were used at the same time.

1826. *In Syphilis*, the value of the iodide is universally recognized, but it is in the secondary and tertiary, or constitutional forms of the disease alone that its full powers are displayed; in the primary form it exercises comparatively little influence. *In the Inherited Syphilis of Childhood* it is almost always of great service according to Hill and Cooper (p. 424). *In Syphilitic Affections of the Bones*—e.g., *Nodes, Caries and Necrosis, and Periostitis*—it holds the first place in our list of remedies; and, though its effects are not so immediately manifest, it exercises no less certain an influence on *Syphilitic Affections of the Skin*, especially in those of a *tubercular character*, *Rupia*, &c. It may also be given with great advantage in *Neuroses of Syphilitic origin*, and in *Syphilitic Cachexia*. It is alleged against the use of the iodide in these cases, that the cures effected by it are not permanent, and that relapses often occur when the remedy is discontinued. In such cases it may be doubted if the remedy has been given in sufficiently large doses, or been sufficiently long persevered in. The dose has been very variously estimated, some exhibiting it in very small doses (gr. ij.–iij.), others, the majority, using medium doses (gr. v.–vj. thrice daily), whilst a third class prescribe it in doses of gr. lx.–lxxv. Amongst those who advocated the last-named doses is Sir H. Thompson,[2] who, after extensive experience, draws the following conclusions: 1. The iodide in large doses (gr. xxx.–lxxv. daily) is almost a specific for the cure of *large spreading tertiary, or late secondary ulcerations of the skin*, such as those so common and generally so intractable, affecting all parts of the body, and which often follow an eruption of rupia. 2. For those late *syphilitic eruptions which affect the nose* so disastrously, and often so rapidly, these same doses are equally valuable. 3. Iodism is exceedingly rare in the presence of tertiary syphilis, and large doses do not, as a general rule, occasion loss of flesh. If they cure the syphilis, the patient usually gains weight under their influence. The observations of Dr. J. Pollock, Dr. Sisson, and others tend to prove not only the safety, but the efficacy of large doses of the iodide in this class of cases. Its failure may doubtless be sometimes traced to its having been exhibited in too small doses. Various combinations have been proposed to increase its efficacy; thus Sir J. Paget[3] advises ammonia:—℞ Potass. Iod. gr. iij., Spt. Ammon. Arom. ℥xxx., Aq. ʒiv., taken thrice daily: in exceptional cases he in-

[1] Edin. Med. Journ. Dec. 1859.
[2] Lancet, Dec. 28, 1867.
[3] Brit. Med. Journ. May 9, 1868.

creases the iodide to gr. xv.–xxx. daily; a dose to be taken soon after a meal. Dr. Sisson[1] advises its being combined with carbonate of potash, which prevents iodine being set free in the stomach; and Dr. Peter Eade[2] advises the citrate of iron and quinine (āā gr. x.). Thus given, he states that he has repeatedly found it effectual, whilst the same dose of the iodide alone has exerted little or no power over the progress of the disease. Dr. Sisson (*op. cit.*) considers that in susceptible persons, in order to avoid catarrhal symptoms, the dose should be small, much diluted, and taken on an empty stomach.

1827. *Syphilitic Nervous Affections*, including under this term *Affections of the Coverings of the Brain, with or without lesion of the cerebral substance, giving rise to Epileptiform Attacks, Hemicrania, Nausea, Vertigo or Hemiplegia, Optic Neuritis, General Paralysis* and *Dementia, Paralysis of one or more of the Cranial or Spinal Nerves*, and *Progressive Locomotor Ataxy*. In all these cases, when they are of syphilitic origin, Dr. Buzzard[3] bears strong testimony to the value of the iodide. He commences with gr. x. in water, between meals, increased, if necessary, at intervals of a few days, to gr. xv.–xx. up to gr. lx. daily. It should be continued for some time after the symptoms disappear, its administration being alternated, if the patient be anæmic, with mineral acids and iron. In certain of the epileptiform attacks it may be advantageously combined with the bromide in doses of gr. xx.–xxx. It is, in all these cases, of the highest importance to diagnose their true origin, as the earlier, supposing them to be syphilitic, they come under treatment the more rapid and certain is the cure.

1828. *In Chronic Gout*, the iodide proves of service. It undoubtedly possesses great power in controlling inflammation of fibrous tissues; its action on the periosteum is very marked in cases of *Nodes*, also in *Painful Neuralgic Affections dependent upon an Inflammatory State of the Nerve Coverings;* it is more especially useful when the pains are increased at night, and by the heat of bed. It is also useful in removing the recent thickening of the tissues around joints; but proof is still wanting of its possessing any power of causing the absorption of urate of soda. In gouty inflammation, when fluid has been effused into the cavities of the joints, and has been slow of absorption, the iodide often appears to act with great advantage. (Dr. Garrod.)[4]

1829. *In Rheumatic Gout, in weakly and Cachectic Constitutions*, Dr. Fuller recommends the following mixture:—℞ Potass. Iod. gr. v.–x., Liq. Potass. ♏xlv., T. Cinchon. Co. ʒjss., Decoct. Sarsæ Co. ʒiij. Three times a day. When the skin is inactive, and the circulation languid, it is best combined with guaiacum. *When connected with a Syphilitic Taint*, it seems insufficient of itself to arrest the mischief, but when conjoined with corrosive sublimate (Liq. Hydrarg. Perchlorid. ʒj.–ʒij.), it speedily produces a beneficial effect. It has been repeatedly observed, that the disease

[1] Lancet, Dec. 29, 1866.
[2] Lancet. Jan. 18, 1868.
[3] Practitioner, May 1871.
[4] Reynolds's Syst. of Med. i. p. 862.

which had previously resisted these remedies exhibited separately, has yielded to them when given in combination. *In Chronic Rheumatism, when the Periosteum is implicated,* no remedy is more generally serviceable than the iodide, especially in conjunction with mezereon. The same treatment has been found of great service in *Gonorrhœal and Mercurial Rheumatism. In Chorea occurring in Children subject to Chronic Rheumatism,* Dr. Hillier considers that the iodide may prove useful.

1830. *In Sciatica and Lumbago,* when of a sub-acute or chronic character, and the patient has to follow his outdoor avocations, Dr. Graves strongly advises the iodide, in doses of ʒj. daily, dissolved in decoction of sarsaparilla. In his own person, and in many other cases, he found it most efficacious. Dr. Anstie[1] limits its use mainly to *Sciatica of a Syphilitic Origin,* and here, given in large and frequently repeated doses up to gr. lx.–cxx., or even more, in the twenty-four hours, it rarely fails, he says, to produce a rapid and complete cure. Should this fail, try the bichloride of mercury (*q.v.*).

1831. *In Face-ache,* partaking more of a rheumatic than a neuralgic character, Sir T. Watson (i. p. 717) found the iodide, in doses of gr. v.–vj., work a speedy and permanent cure. I have found it very serviceable in numerous cases.

1832. *In Chronic Inflammation and Enlargement of the Liver,* the iodide, given in combination with taraxacum, exercises a beneficial influence. Dr. Copland observes that it is chiefly when enlargement, obstruction, or torpor of the liver occurs after periodic fevers, or in the scrofulous diathesis, that he has found the iodide of potassium, employed externally or internally, or both, and in conjunction with other deobstruents, as liq. potassæ, or alternated with purgatives, the most serviceable. Mr. Beckford[2] records a case of *Hydatid Tumour of the Liver,* which disappeared under the use of the iodide, in doses of gr. xxx. daily. *In Dropsy connected with Disease of the Liver,* he regards it as a most valuable deobstruent and diuretic, and more to be depended upon than any other medicine. *In that form of Dropsy which occurs after Scarlet Fever,* Dr. Graves also states that he can speak with the greatest confidence of the iodide; and that he has employed it with signal benefit in *Hypertrophy of the Liver.* Dr. Mackenzie found the iodide, internally administered, very effectual in curing *Muscæ Volitantes depending upon Hepatic Derangement. In Tabes Mesenterica,* the internal use of the iodide, in small and repeated doses, has a marked influence in reducing the tumid state of the abdomen, in improving the appetite and the state of the stools, and in establishing the general health. Dr. Barlow (p. 561) recommends the following formula:—℞ Potass. Iod. gr. iij., Liq. Potass. ♏xxiv., Spt. Æther. Nit. ʒj., Decoct. Sarsæ Co. ad fʒiij. M. Dose, a tablespoonful thrice daily for a child æt. three years.

1833. *In Chronic Bright's Disease,* the iodide has sometimes

1 Med. Times, June 13, 1874. 2 Practitioner, Nov. 1868.

proved of signal service, even when the dropsy has been extensive and the urine very scanty. In these cases, together with an increase of the urine, and the disappearance of the dropsy, there has been improvement in the general health. Possibly in these instances the affection was of syphilitic origin. (Dr. Ringer, p. 156.)

1834. *In the Advanced Stages of Pneumonia, Pleurisy, and Bronchitis*, the iodide variously combined, according to circumstances, appears to aid in restraining inflammatory action, and in promoting the absorption of effusions and indurations. *In Chronic Winter Cough* and in *Chronic Bronchitis*, when with dyspnœa there is a hard, dry, racking cough, Dr. Lawrie, of Glasgow, advises the iodide; he considers that it acts by stimulating the bronchial mucous membranes, and promoting their secretion. *In Emphysema of the Lungs*, it is a valuable adjunct to other remedies. From Dr. Cotton's trials with it in *Phthisis*, it was found to yield no marked results. When, however, it is of syphilitic origin, it proves highly serviceable, and is best given with cod-liver oil.

1835. *In Asthma*, the iodide, according to Dr. Hyde Salter, entirely fails in a great many cases, while those in which its success is complete are comparatively few. Sometimes, however, the most striking results attend its use. Being satisfied of its occasional great value, he urges the propriety of its use in any case in which it has not been tried. It often requires to be continued for some time before it begins to manifest its effects. Dr. Lawrie (*op. cit.*) regards it as specially useful when there is an abnormally dry condition of the mucous membranes.

1836. *In Chronic Pericarditis*, the iodide, in doses of gr. iij.–v. thrice daily, has sometimes been administered advantageously; appearing to favour the absorption of effused fluid. *In Hypertrophy of the Heart*, also, the long-continued use of small doses of the iodide appears, in some cases, to exercise a beneficial influence. It requires to be persevered in for a considerable length of time.

1837. *In Aneurism of the Aorta*, the iodide was introduced by Nélaton[1] in 1859, and the testimony of Drs. Bouilland,[2] Chuckerbutty,[3] Roberts,[4] and Balfour,[5] is very favourable as to its value in this disease. Dr. Balfour holds that no treatment for aneurism, and especially for internal aneurism, holds out anything like an equal prospect of relief, if not of cure, with that by the iodide of potassium. It must be given in large doses (gr. xx.) and continued for many months. Its mode of action is unknown. Dr. Balfour thinks that it is not by increasing the coagulability of the blood, but by its sedative action on the heart, and by some peculiar action on the fibrous tissue by which the sac is aided, and its walls strengthened and condensed. A case of *Abdominal Aneurism*

[1] Clinique Européenne, July 1859.
[2] Clinique Européenne, Aug. 1859.
[3] Brit. Med. Journ. 1862.
[4] Brit. Med. Journ. Jan. 1863.
[5] Edin. Med. Journ. July 1868, and Jan. 1874.

successfully treated with the iodide is recorded by Dr. Philipson.[1] Dr. Waters, however, states that his experience in its use does not enable him to say much in its favour.

1838. *In Saturnine Affections,* M. Melsens introduced in 1849 the use of very small and cautiously increased doses of the iodide of potassium, in cases of chronic lead poisoning. The theory of its action is, that it renders metallic substances soluble, which might otherwise remain in the system, by associating them with another substance that is readily eliminated by the organs of secretion. This theory, if correct, shows the necessity of caution in the use of the remedy, which, if given in large doses, would favour the absorption into the system of a powerful poison. Its value in these cases is established beyond a doubt. *In Mercurial Palsy and Tremors,* the iodide, acting on these principles, has been given and found beneficial. *In Violent Mercurial Salivation,* the iodide in decoction of cinchona often proves serviceable.

1839. *In Flatulent Dyspepsia,* in which, whether from a too starchy diet, deficient or hasty mastication, decayed teeth, the abuse of tobacco, or other causes, the salivary secretion seems either deficient in quantity or faulty (*e.g.*, acid) in quality, Dr. Brinton states that a small dose of the iodide (gr. j.–ij.) with bicarbonate of potash (gr. vij.–x.) will suffice sometimes to effect a marked change after two or three administrations.

1840. *Diseases of the Eye. In Syphilitic Iritis,* the iodide is ordinarily inferior in efficacy to mercury, but in obstinate cases Mr. Soelberg Wells[2] states that great benefit is derivable from the iodide in large doses. *In Catarrhal Ophthalmia,* it proved signally useful in the hands of Mr. Ostrey.[3] Dr. Copland employed it successfully in *Amaurosis;* two of the cases in which it proved effectual were consequent upon apoplectic seizures. *In Opacities and Ulcerations of the Cornea,* a saturated solution of the iodide in glycerine, is recommended by Dr. Castorani,[4] but the intense pain it is said to cause is a great objection to its use. (See also IODINE.)

1841. *Coryza.* Ten grains of the iodide taken at bedtime often cut short an acute cold in the head, especially at the outset. In *Influenza,* it appears to be useless. In ten-grain doses several times a day it is said to cure *Violent Paroxysmal Sneezing.* (Ringer, p. 153.)

1842. *Looseness of the Teeth, depending upon Periostitis of the Alveolar Processes,* known by the great pain, swelling, and sponginess of the gums, is often effectually cured by the iodide. Dr. Graves[5] relates a case cured by it, in doses of gr. x. thrice daily.

1843. *In Engorgement of the Breasts in Puerperal Women,* Dr. Billi, of Milan, prescribes it with success. He gave from gr. vij.–ix., in divided doses daily.

1844. *In the later stages of Orchitis* the iodide in doses of gr.

[1] Brit. Med. Journ. i. 1878.
[2] Lancet, Sept. 18, 1869.
[3] Dublin Journ. xxi. p. 417.
[4] Practitioner, Sept. 1868.
[5] Dublin Med. Journ. xviii. p. 233.

iij.–x., twice or thrice daily, is of great service. (Hill and Cooper, p. 557.)

1845. *In Chronic Skin Diseases*, especially when of a syphilitic origin, or occurring in persons of scrofulous diathesis, the iodide in large doses often proves most useful. Amongst other diseases, *Sycosis*, *Pemphigus*, and *Erythema Cachecticum* have been found to improve under its internal administration. *In Scabies*, it has been advised locally in the form of ointment (gr. xxx., Ung. ℥j.) or lotion (gr. lx., Aq. ℥viij.–xvj.), but it has never come into general use. *In Simple Ulcers of the Legs*, Drs. Tige and Trastour[1] advocate the internal use of the iodide in doses of gr. xv.–xx. in water thrice daily before meals. It is to be used in addition to local applications, the operation of which it seems to facilitate.

1846. *In Lupus of the Limbs*, Mr. Milton regards the iodide as the most efficient remedy; gr. lx., gradually increased to gr. cxx., in a bitter infusion, weekly, generally suffices. When it cures the disease, it always acts soon, and the action goes on till the part is healed. When improvement comes to a standstill, augmented doses will generally have no effect; calomel should then be employed.

1847. Potassii Nitras. Nitrate of Potassium. Nitre. Saltpetre.

Med. Prop. and Action. The effects of the nitrate of potash depend in a great measure upon the state in which it is given, and upon the quantity of fluid in which it is dissolved; thus ℥j., either given in powder or dissolved in a small quantity of water, has produced inflammation of the bowels, and even death; whilst the same quantity given in one or two quarts of water acts as a safe diuretic, and efficient refrigerant and diaphoretic. It has also had anti-scorbutic properties assigned to it, but apparently on insufficient grounds. The physiological effects of this salt have been closely observed by Dr. Basham. He observes (1) that, in the majority of cases, nitre produces no obvious effect upon the force and frequency of the pulse, the digestive functions, or the quantity of urine secreted; (2) that the urine always acquires a high specific gravity, 1030–1040, and that the nitrate may be detected in it; (3) that blood, which before the exhibition of nitre is cupped and buffed, loses much of those characters after its administration; and the salts, which were previously deficient, are found afterwards greatly increased in quantity. Other observers find that it exercises a powerful sedative action on the heart and vascular system. As a vascular sedative, it should be given in doses of gr. xx.–xxx. Dr. Stevens observed that it communicates a bright arterial tint to venous blood, and that, when added to fresh-drawn blood, it impedes coagulation. It is not improbable that it produces the same effect in blood in the living body. Dr. Flint found that under its use there was a considerable augmentation of the solids of the urine. Its diuretic effect is increased by copious dilution; its diaphoretic, by the addition of tartar emetic. Externally, it forms with the chloride of ammonia (℥x. of the mixed salts to Oj. of water) an excellent cold lotion.

Dose, gr. x.–xxx.

1848. *Therapeutic Uses. In Acute Rheumatism*, the treatment by large doses of nitre (℥ij.–iij. in Oiv. of barley-water daily, in divided doses) was formerly much in vogue, but it apparently has no advantages over the bicarbonate of potash (*q.v.*), which is safer

[1] Ranking's Abstract, xxx. p. 236.

and more manageable. *In Chronic Rheumatism*, nitre in ten-grain doses forms a serviceable adjunct to other diuretics; but little reliance is to be placed upon it alone.

1849. *In Purpura Hæmorrhagica, Purpura Simplex, and Passive Hæmorrhage*, nitre has been employed with great success by Dr. Carlyon. In ordinary cases of *Purpura simplex*, gr. x. thrice daily was found sufficient; but in more severe cases, gr. x.–ʒj. every two or three hours was required. He advises its exhibition with an equal quantity of sugar in cold water. The diet should consist chiefly of gruel, farinaceous food, barley-water, &c.

1850. *In Hæmoptysis and other Internal Hæmorrhages accompanied by Vascular Excitement*, nitre proves serviceable by diminishing the arterial disturbance and fever, but it should not be relied upon alone. Dr. Gibbon[1] relates numerous cases in which it produced unequivocal benefit. It may be given in doses of gr. viij.–x. several times daily, largely diluted, or combined with tartar emetic or digitalis.

1851. *In Febrile and Inflammatory Affections*, nitre, largely diluted in the form of lemonade, proves an excellent refrigerant and diuretic; from one to two drachms may thus be taken in the course of the day. Thus given, it proves highly serviceable in *Influenza*. Free dilution is indispensable. A popular remedy, sometimes successful in mild cases of *Incipient Inflammatory Sore Throat*, is a small piece of nitre allowed to dissolve slowly in the mouth.

1852. *In Dropsical Affections*, nitre, as in last section, proves of great service as a diuretic, particularly when combined with squill, spirits of juniper, and other remedies of the same class.

1853. *In Spasmodic Asthma*, great temporary relief occasionally results from the inhalation of the fumes of burning nitre. For this purpose dissolve ʒiv. in Oss. of boiling water in an open vessel; immerse moderately thick blotting-paper in it for a minute or two, and then dry it by the fire; cut it in pieces about four inches square, and burn one, or, if required, two pieces in the bedroom, before retiring to rest, at bedtime. It may also be held near the face, so that the fumes may be more directly inhaled. Dr. Hyde Salter reports most favourably of its effects in innumerable instances. Dr. Dyce Duckworth[2] suggests that the coarsest brown paper be employed in preparing nitre paper, the old cordage in it proving of value in giving off when burnt tarry empyreumatic fumes. He further advises that this should be painted over with several coatings of Friar's balsam; this he has found a valuable addition. When used, the bed-curtains should be drawn around the patient, so that a fully charged atmosphere may be obtained. A piece four or five inches square should be used each time. Dr. Murrell[3] thinks that nitre-paper in these cases often fails because it is not strong enough, and he suggests dipping thick blotting-paper in a hot saturated solution of nitre and chlorate of potash,

[1] Med. Cases and Reports, pt. ii.
[2] Practitioner, May 1878.
[3] Brit. Med. Journ. June 11, 1881.

and before quite dry sprinkling with Friar's balsam, &c. As it burns with a flame, it should not be used too near the bed. His directions, which are too lengthy for insertion here, are worthy of every attention. The fumes, he says, nearly always induce sleep, and that he has used them with success in *Insomnia* when most ordinary means had failed. Though most useful in purely asthmatic cases, nitre fumes, either simple or compound, often afford relief in the paroxysmal *Cough of Chronic Bronchitis.*

1854. *In Menorrhagia*, Dr. Waller[1] considers the nitrate a most effective depressant. After premising blood-letting and laxatives, he advises this salt, in doses of gr. xv.–ʒss., well diluted with barley-water. *In Dysmenorrhœa*, he also found it highly serviceable. *In Leucorrhœa*, Dr. Dewees states that in some obstinate cases he effected a cure with the following formula :—℞ Potas. Nit. gr. x., Alum gr. v. To be taken thrice daily. *In Gonorrhœa*, it proves useful, when given largely diluted, in relieving the *ardor urinæ.*

1855. *Freckles.* Powdered nitre moistened with water, applied to the face night and morning, will, it is said,[2] soon remove all traces of them.[3]

1856. Potassii Permanganas. Permanganate of Potassium.

Med. Prop. and Action. The action of the permanganate on the system, when taken internally, is undetermined, but it is supposed to act by oxidizing the blood. (See Manganese.) Locally applied, in substance or strong solution, it acts as a stimulant and mild escharotic, but when largely diluted it causes neither pain nor irritation when applied to mucous surfaces. It readily yields its oxygen to bodies having an affinity for that element, hence its great value as a deodorizer ; but in order to develop its powers in this character, it is requisite to place it in contact with the source of the offensive odour. As a general deodorizer it is inferior to carbolic acid. Antiseptic powers have been assigned to it, but, from the experiments of Demarquay, it would appear that it possesses little or no power of preventing or arresting the putrefactive process ; but that, when in contact with decomposing substances, it has the power of seizing upon the products of decomposition in their nascent state, and combining with them, or oxidizing them, so as to prevent the usual effects of such emanations, and among them the disengagement of offensive smells. (Stillé.) Stains caused by it may be removed by a weak solution of sulphurous acid, or sulphate of iron, or hydrochloric acid in water.

Dose:—Of the Permanganate, gr. j.–iv., largely diluted. *Of the Solution* (gr. iv., Dist. Water ʒj), ʒij.–iv. This is half the strength of Condy's Disinfecting Fluid. (Squire.) For external application, ʒj. of the solution ad Aq. ʒv.–x.

1857. *Therapeutic Uses. In Acute Rheumatism*, the permanganate has been employed internally by Dr. J. F. Duncan,[4] with apparently good effects. According to his observations, it cleans the tongue, relieves pain, acts slightly on the bowels, and removes turbidity and fœtor of the urine where this existed. The only drawback he found to it was its unpleasant taste. He employed a mixture containing 1 part of Condy's Fluid and 7 parts of water, and of this ʒss. was given every second hour.

[1] On Diseases of the Womb, p. 50.
[2] Druggist, Oct. 1874.
[3] Braithwaite, lxx. p. 53.
[4] Med. Press, May 16, 1866.

1858. *In Amenorrhœa,* the value of the permanganate was first pointed out by Drs. Ringer and Murrell,[1] who speak confidently of its powers. It has proved most effectual in those cases where the flow is scanty or delayed, or even absent for as long a period as two years; also in cases where the arrest has been caused by a chill or exposure to cold. It acts equally well in plethoric and anæmic subjects. It should be given in one-grain doses in pill thrice daily till the catamenia appear, then discontinued until four days prior to the next period, and continued till the discharge ceases. Dr. Ringer (p. 243) states that he began with the solution of the permanganate (ʒss.–ʒj. thrice daily), but had to abandon it for the pilular form, as its disagreeable taste excited nausea, &c. This remedy has, after prolonged trial, proved most successful.

1859. *In Diphtheria,* attended with fœtor of breath, diluted Condy's Fluid (ʒij., Aq. ℥vj.) makes a useful gargle. (Dr. Hillier.) Independent, however, of this condition, a solution of the permanganate (gr. x., Aq. ℥xx.) has been extensively employed as a gargle by Dr. Watson Campbell,[2] and is reported of most favourably. He prescribed iron and port wine internally at the same time.

1860. *In Cancerous, Gangrenous, and Ill-conditioned Ulceration,* a strong solution acts favourably, both as a mild escharotic and as a deodorizer. Dr. Leavitt,[3] acting on a knowledge of the benefit derived from it in *Sloughing Ulcers, Phlegmonous Erysipelas,* and *Hospital Gangrene,* during the American Civil War, was led to employ it in *Carbuncle,* with the best results. The solution (gr. xxx., Aq. ʒj.) was applied by means of a brush, immediately after incision of the carbuncle, and dressings saturated with it were subsequently employed. It seems worthy of further trial.

1861. *In Fœtid Discharges from the Nasal, Aural, Vaginal and other Passages,* the diluted solution forms an excellent injection. To remove *Fœtor of Breath arising from local causes*—e.g., *Smoking, Carious teeth,* &c.—the diluted solution (ʒij., Aq. Oj.) is an effectual deodorizer. It also forms a useful gargle in *Scarlatinal* and other forms of *Ulcerated Sore Throat.* In incipient and mild cases of the latter affection, I have seen on several occasions ♏v.–viij. of Condy's Fluid, taken internally, in a wineglassful of water, at bedtime, effectual in relieving the symptoms or removing them altogether. *For Syphilitic Affections of the Mouth and Throat,* a solution of the permanganate (Liq. ʒij.–iv. ad Aq. ℥x.) forms an excellent gargle. (Hill and Cooper, p. 437.)

1862. Potassii Sulphas. Sulphate of Potassium.

Med. Prop. and Action and Therapeutic Uses. In doses of gr. xv.–lx. it is a safe and efficient aperient, particularly when combined with rhubarb (Pot. Sulph. gr. xxx.–lx., Pulv. Rhei gr. v.–x.); but in large doses, as ʒj -ij., it appears to act as a violent irritant; so much so, that death has followed its incautious use. In France, it is stated to be used popularly as an abortive. The French physicians attribute to this salt the power of *repressing the secretion of milk.* It is an ingredient in Pulv. Ipecac. Co. According to Dr. A. T. Thomson,

[1] Lancet, Jan. 6, 1883.
[2] Edin. Med. Journ. Feb. 1867.
[3] Braithwaite's Retros. vol. vi. (1867), p. 300.

it is more useful than the other saline purgatives, in *Jaundice and Dyspeptic Affections.* It is also an eligible aperient in *Hæmorrhoidal* cases.

Dose, gr. xv.–lx.

1863. POTASSII TARTRAS. Tartrate of Potassium.

Med. Prop. and Therap. Uses. In doses of gr. lx.–ʒss. it is purgative, producing watery evacuations; in smaller doses (gr. lx.–cxx.), largely diluted, diuretic. It acts on the whole intestinal canal, operates rapidly without much griping, is mild and efficient, and lessens the griping quality of senna and scammony. (Thomson.) When taken internally, it is absorbed into the circulation, and has been detected in the urine in the form of a carbonate. It is chiefly used as a mild purgative in *Dyspeptic and Hepatic Affections, attended with some slight increased or Febrile Action*, and as a means of rendering *acid urine alkaline. In Gonorrhœa*, during the acute stage, Mr. Bryant, of Guy's Hospital, prescribes with success gr. xx.–xxx. of the tartrate, three or four times a day; and after the acute stage has passed he combines it with potassio-tartrate of iron.

1864. POTASSII TARTRAS ACIDA. Acid Tartrate of Potassium. Bitartrate of Potash. Cream of Tartar.

Med. Prop. and Action. In doses of gr. xx.-lx., largely diluted and frequently repeated, it acts as a refrigerant and diuretic, communicating alkaline properties to the urine, in which it has been detected in the form of carbonate. In doses of gr. lx.-cxx. it acts as a mild aperient; and in larger doses as a hydragogue cathartic. From its hydragogue purgative action, it is advantageously prescribed in dropsical affections. If its use be continued for too long a period, it induces emaciation and derangement of the digestive organs. *Post-mortem* examinations of persons who have died from overdoses show extensive inflammation of the stomach and intestines. When its purgative action is desired, it is best given combined with other purgatives; of these, jalap, in the form of Pulv. Jalapæ Co., is the best which can be employed. Dissolved in water and flavoured, it makes a good refrigerant drink in fevers, &c. Gr. clxxx. of the acid tartrate and gr. cxx. of the carbonate of soda, both in solution, and mixed, form an agreeable effervescing aperient. It is an ingredient in Conf. Sulphuris and Pulv. Jalapæ Co.

Dose, gr. lx.-ʒss.

1865. *Therapeutic Uses. In Dropsical Affections*, the acid tartrate, either alone or combined with digitalis, squill, &c., is a very valuable remedy. It increases the quantity of urine, produces copious watery stools, and in some instances lessens the dropsical swelling in a marked manner in a few days. In others, this effect is not seen for three or four weeks. It is often associated with juniper berries in infusion (Potas. Acid. Tart., Juniper. Bacc. Contus. āā ʒss., Aq. Ferv. Oj.), and in the idiopathic forms of general dropsy few combinations are more efficient. (Stillé.)

1866. *In Albuminuria*, the acid tartrate often proves very serviceable. "The best diuretics in *Acute Bright's Disease*," observes Dr. G. Johnson,[1] "are those means which tend to lessen congestion of the kidneys, as dry cupping, fomentations and poultices to the loins, warm baths, and a free use of diluent drinks, one of the pleasantest and most efficacious being the imperial drink made with cream of tartar and lemon." Prof. Gairdner[2] also testifies to its value in renal cases; his practice being to give Pulv. Jalapæ Co.

[1] Brit. Med. Journ. June 21, 1873. [2] Glasgow Med. Journ. Sept. 1880.

gr. x.–xxx. every four hours until purgation is established, which is followed up by solid cream of tartar, in electuary, in gr. xx. doses; and finally, when diuresis occurs, it is kept up by cream of tartar in solution, with orange or lemon peel (imperial drink) indefinitely, and with the happiest results. *In Scarlatinal Albuminuria*, especially in weakly anæmic subjects, it may be advantageously combined with tartarated iron.

1867. *In Fevers and Inflammatory Attacks*, an agreeable refrigerant drink is formed by dissolving gr. lx.–xc. of acid tartrate in a pint of boiling water, and flavouring with lemon-peel and sugar. It may be used as a common drink.

1868. *In Beriberi*, Dr. Malcolmson[1] observes that, "of all diuretics, none is so generally successful and universally useful as cream of tartar, which has generally been adopted by experienced practitioners, in beriberi. Its laxative effect, grateful taste, and soothing qualities, are powerful recommendations, in addition to the direct benefit from its diuretic powers." He advises its exhibition in any simple bland vehicle, and to make it a common drink. Mr. Ridley, who strongly advocated this salt, advises its exhibition in punch or gin.

1869. *In the Advanced Stage of Acute Dysentery, and in Chronic Dysentery*, when laxatives are indicated, especially when the stools abound with thick viscid mucus, the acid tartrate appears to be especially indicated. It may be given with equal parts of sulphur, or with jalap in the form of Pulv. Jalapæ Co. It seems in these cases to exercise a special influence in diminishing the mucous intestinal secretion, and of unloading the portal system.

1870. *In Piles*, a popular and very useful remedy is a combination of equal parts of the acid tartrate and sulphur, given either in milk or confection of senna. *In Prolapsus Recti*, the same formula proves very serviceable.

1871. *To the Ulceration of Rupia*, Rayer regarded finely powdered cream of tartar one of the best local applications. A strong aqueous solution has been favourably spoken of as a local application in *Epithelial Cancer*. It is stated not only to afford relief to the pain, but to modify the character of the ulceration. Its action is probably analogous to that of acetic and citric acid (*q.v.*).

1872. PUNICA GRANATUM, *Linn.* Pomegranate.

Med. Prop. and Action. The root-bark (*offic.*) is a valuable tæniafuge, its activity residing in an alkaloid PELLETERINE: of this the Sulphate, in form of white acicular crystals, and the Tannate, a greyish amorphous powder, have been used to replace the root-bark. The rind of the fruit, which contains a large proportion of tannin and mucilage, is a very useful astringent and is best exhibited in the form of decoction (℥ij., Cloves bruised gr. lx., Water Oiss. boiled to Oj.) in doses of f℥j.–ij. With the cloves omitted, this decoction forms a very useful astringent gargle, injection, &c.

Dose:—Of Decoction of the Root-bark, f℥ij.–iv.

1873. *Therapeutic Uses.* As a remedy for *Tænia or Tape-worm* the powers of pomegranate root were known to the ancients, and

[1] On Beriberi, p. 274.

though still in use, especially in the East, it is on the whole inferior to Male Fern. Of the decoction (*ante*), f℥ij. should be administered fasting, and repeated every half-hour until four doses have been taken. This should be followed by a dose of castor oil, and in the course of a few hours the entozoa are expelled lifeless. In the same way a dose of the Sulphate of Pelleterine (gr. v.–viij.) or of the Tannate (gr. viij.) taken fasting should be followed by a dose of castor oil or other purgative. Of these salts further evidence of their efficiency is required.

1874. *In Chronic Diarrhœa and Dysentery*, the decoction of the rind of the fruit (*ut supra*) occasionally proves highly serviceable. I have seen it arrest the discharge in some instances, amongst the natives of India, when other astringents had previously failed.

1875. *In Cancer of the Uterus*, Dr. J. Clarke advises the following injection, when the discharge is so profuse as to cause great debility :—℞ Decoct. Cort. Fruct. Granati Oj., Alum ℥ss. M. *In Leucorrhœa*, the same injection, or with a smaller proportion of alum (gr. lx.), may be used with advantage.

1876. *In Relaxed Sore Throat*, the decoction, with the addition of alum (gr. lx. ad Decoct. Oj.), proves very useful as a gargle.

1877. Pyrethri Radix. Pellitory Root. The dried root of Anacyclus Pyrethrum, *D.C.*

Med. Prop. and Action. Irritant and sialogogue. It is extremely acrid, and when rubbed on the skin, it causes much irritation, and even inflammation. When chewed, the taste is at first insipid, but after a few seconds it causes a hot, pungent, pricking sensation in the tongue and lips, with a copious secretion of saliva. Its activity appears to depend on an acrid oil, and a compound resin, *Pyrethrin*. It is not employed internally; its chief use is as a masticatory. A tincture is officinal in B. Ph.

1878. *Therapeutic Uses. Toothache* is sometimes relieved by chewing slowly a piece of pyrethrum root, or by applying the tincture on a piece of cotton to a carious tooth. It has also been thought useful in *Paralysis of the Tongue and Muscles of the Throat, and in Nervous Aphonia.* In each case it acts as a powerful local stimulant and sialogogue. *In Relaxed Sore Throat*, the following is a useful stimulant gargle :—℞ T. Pyrethri f℥iij., Aq. ℥viij. M. O'Shaughnessy found it effectual in two obstinate cases of *Spontaneous Salivation*. It is a remedy of very minor importance.

1879. Pyrogallic Acid. Acidum Pyrogallicum. A product of the decomposition of gallic or tannic acid by heat (410° F.) It occurs in the form of small, white, odourless, tasteless crystals, conveying when placed on the tongue a marked sensation of coldness. Soluble in 2½ parts of water, and in 10 of melted lard.

Med. Prop. and Action. Astringent and antiseptic, the latter quality depending upon its great affinity for oxygen. It darkens the skin and hair, and conjoined with solution of nitrate of silver is used for blackening the hair.

1880. *Therapeutic Uses.* From its remarkable astringent effects on the hands of those engaged in photography, in which it is much employed, Dr. A. Vesey [1] was led to employ it in *Internal Hæmorrhage*, in which, especially in *Hæmoptysis of Phthisis*, he found it act very effectually in grain-doses at short intervals (every hour or oftener.) He considers its action more rapid and certain than the astringents commonly in use.

1881. With regard to its use in *Skin Disease* Dr. Morrow [2] (U.S.) draws the following conclusions:—(1) That it is free from some of the more objectionable features of chrysophanic acid (*q.s.*): thus it does not (in ten per cent. ointment) inflame the skin, or produce œdema of the face when applied to the scalp, whilst the discoloration it causes is less marked and permanent. (2) That it should nevertheless be used with caution, as pernicious results have followed its too free use. When freely used for two or three weeks it produces an olive-green or tarry condition of the urine, with prostration, febrile disturbance, &c. (3) That its curative action in *Psoriasis* is much less rapid, but apparently more permanent than that of chrysophanic acid. (4) That its freedom from irritation, and its absence of odour, render it an admirable substitute for chrysophanic acid and oil of cade in diseases affecting the scalp and face. (5) That while its effects in psoriasis is slower than that of chrysophanic acid, its range of action is much wider; thus it causes the disappearance of the *Nodosities of Lupus, the Hyperplasiæ of Syphilis, Epidermic and Papillary Hypertrophies;* and seems to have a good effect in *promoting the cicatrization of wounds.* (6) That it seems to act by virtue of its stimulant and astringent properties; it hardens the tissues, shrivels up unhealthy granulations, and acts as a hæmostatic.

1882. Quassiæ Lignum. Quassia Wood. The wood of Picræna excelsa. *Lindl.*

Med. Prop. and Action. Bitter tonic and stomachic. Its activity appears to reside in a bitter neutral principle, *Quassine.* It has many advantages over most other vegetable tonics; it does not increase the animal heat, it produces no sensible arterial excitement, it causes no constipation, and may be administered in infusion, in combination with the salts of iron, and of all other metals with the exception of the nitrate of silver and acetate of lead. An increased flow of urine often follows its exhibition. It acts as a powerful narcotic poison on flies and other insects; the alcoholic extract introduced subcutaneously kills small animals with obscure narcotic symptoms. (Christison.) It is said to be used by brewers as a substitute for hops.

Dose:—Of Quassia Wood in Powder, gr. x.–xx. *Of the Extract*, gr. iij.–v. *Of the Infusion*, f℥j.–ij. *Of the Tincture*, f℥ss.–ij.

1882*. *Therapeutic Uses. In the Malarious Intermittents,* quassia was formerly held in high repute, and although, like many other powerful bitters, it is apparently capable of controlling mild cases, it has in severe ones been quite superseded by cinchona and its alkaloids. As an antiperiodic it was given in strong infusion

[1] Dublin Journ. Med. Sci. 1878. [2] Dublin Med. Journ. April 1883.

℥ij. Aq. Oj.) With mineral acids it forms an excellent tonic in *Convalescence after Fevers and debilitating diseases.*

1883. *In Dyspepsia*, attended by acidity of the stomach, sour eructations, and marked especially by vertigo and a tendency to syncope, a combination of carb. of soda and infusion of quassia has been found of signal use. (Trousseau and Pidoux, ii. p. 380.) The same may be said of other more evidently *Nervous and Hysterical Affections, arising in connection with Dyspepsia.* (Stillé.) It has been found peculiarly adapted for the *Dyspepsia of Drunkards.* Dr. Lettsom thought highly of it in the advanced stages of *Diarrhœa.*

1884. *Against Round Worms or Lumbrici*, occurring in children, the infusion taken for three or four days in succession, and followed by a brisk purge, is sometimes very effective. In the treatment of *Thread Worms*, Sir T. Watson states that he has found the infusion, in the form of enema, very effectual.

1885. QUERCUS CORTEX. Oak Bark. The dried bark of the small branches and young stems of Quercus pedunculata.

Med. Prop. and Action. Astringent. It has also been regarded as antiperiodic; its astringency depends upon the presence of tannic and gallic acids. It is principally used as an external application, injection, &c.

Dose:—Of the Decoction, f℥j-ij.

1886. *Therapeutic Uses. In Chronic Diarrhœa*, the decoction proves occasionally useful, and it has been advised in the advanced stages of *Dysentery.*

1887. *In Atonic Menorrhagia and Leucorrhœa*, the decoction with or without alum (gr. lx. ad Decoct. Oj.) is a safe and efficacious injection. Dr. Atthill[1] states that it often proves serviceable when solutions of alum and zinc causes irritation, but he advises us to warn the patient that it stains linen.

1888. *In Prolapsus Uteri vel Recti, and in Piles*, decoction of oak bark forms a useful astringent local application.

1889. *In Relaxation of the Uvula, Tonsils*, &c., the decoction may be advantageously used as a gargle.

1890. *In Gangrene, and to indolent and ill-conditioned Ulcers*, poultices of the powdered bark have been applied with advantage. Bigelow advises the decoction as an astringent wash.

1891. QUINETUM. The mixed alkaloids obtained from the bark of Cinchona succirubra and other species cultivated in India, Java, and other parts of the East.

Med. Prop. and Action. It occurs as a crystalline powder, the crystals in mass have a flocculent aspect; they are acicular in form. Quinetum consists of more or less purified

Quinine Sulphate	...	...	...	25 to 30 per cent.
Cinchonidine Sulphate	...	...	...	50 to 55 „
Cinchonine Sulphate	...	...	...	20 to 25 „

Quinetum is soluble in acidulated water, having the same bitter taste which

[1] Med. Press, Dec. 31, 1873.

belongs to quinine. It possesses, however, the advantage of being much cheaper, while its introducers aver its medicinal values are hardly inferior. Mr. Ainslie Hollis[1] finds it invaluable as a tonic. Its drawback is its liability to induce nausea and vomiting.

1892. *Therapeutic Uses.* These must be those to which the pure alkaloids are put. It is said that quinetum is as useful as quinine in *Intermittents;* and Ewart, Chevers Bird, and others, who have had experience of it in the *Malarial Fevers* of India, speak very favourably of its use. Dr. Vinkhuysen[2] employed quinetum in *Ague*, and from his account it would seem very efficacious. Dr. Vinkhuysen found that gr. xv.–xx. would check an attack of an *intermittent;* afterwards he finds gr. iij. taken three times a day is sufficient to keep the patient free from fever. Its efficacy would appear to be due largely to the cinchonidine it contains.

1893. *In General Debility with Loss of Appetite*, quinetum is very valuable. It acts as a bitter and tonic, improves the appetite, and promotes the general well-being of the patient.

For further *Therapeutic Uses* see QUININA.

1894. QUININA. Quinine. An alkaloid obtained from various kinds of Cinchona bark. QUININÆ HYDROCHLORAS (B. Ph. 1885). The Hydrochlorate of Quinine. QUININÆ SULPHAS. Sulphate of Quinine.

Med. Prop. and Action. Valuable tonic and antiperiodic, possessing in an eminent degree all the properties, except the astringency, of Cinchona (*q.v.*). Its physiological effects are thus ably epitomized by Dr. Farquharson:—*On the Nervous System.* Quinine in large doses causes curious brain symptoms, such as partial blindness, well-marked deafness, and ringing in the ears, giddiness and frontal headache with a peculiarly dull, heavy expression of countenance, which in the aggregate constitute what has been designated Cinchonism. Binz has suggested that some at least of these phenomena may be due to partial anæmia of the brain, caused by enfeebled action of the heart. Hammond on the contrary asserts that quinine causes congestion of the brain. Gubler asserts that it stimulates the great sympathetic and auditory nerves. *On the Vascular System.* Moderate doses increase the frequency of the pulse; under larger doses the rate of pulsation falls, arterial tension diminishes, and death may even ensue from convulsion, or sudden collapse following depression of the heart's action. It has a direct effect on the white corpuscles of the blood, checking their amœboid movements, and arresting their tendency to migrate through the walls of the capillaries under inflammatory conditions. It also prevents, in some degree, the due giving up of oxygen by the red corpuscles, and may thus interfere with the oxygenation of the tissues. *On Respiration and Temperature.* No influence on the respiratory function has been observed. On the temperature of a person in full health but little lowering is produced; when, however, fever is present the temperature may be brought down by giving large doses. *On Secretion.* In moderate doses it increases the secretion of saliva, and augments, like most bitters, the flow of gastric juice, stimulating the appetite at the same time. Larger quantities produce an exactly opposite effect; hunger is blunted, and the alkaloid, acting as an irritant to the mucous membrane of the stomach, checks the gastric juice. The urine is found to be unaltered in quantity, but the amount of uric acid, and probably of the urea given off, is decidedly diminished. Quinine is an excellent antiseptic, preventing and arresting

[1] Brit. Med. Journ. 1879, p. 701. [2] Practitioner, 1876.

decomposition. This it does in virtue of its poisonous influence over minute organisms, for we know that the process of decay is caused by the formation and rapid multiplication, within the putrifying fluid, of microscopic bodies called microzymes. These quinine, in small doses, paralyses, and in large doses destroys, and so at once it arrests further destructive action. This, according to some authorities, explains the power of quinine over malarious fevers. See Farquharson, 3rd ed. (1883), p. 237.

As an Oxytocic. The power of quinine to produce uterine contractions was first brought to notice to the profession in Europe by Dr. Monteverdi in 1871, but for many years antecedent to this its action on the uterus was known to American physicians. In 1855 Dr. J. S. Wilson called attention to the subject. Many questions have arisen as to its alleged power in this character. These have been carefully examined by Dr. H. Wood (p. 71), who arrives at the following conclusions:—1. There is no evidence of quinine producing abortion in healthy women, or in females of other animals. 2. That the evidence of its producing abortion in women suffering from ague is inconclusive. Opposed to its alleged power stands the overwhelming fact that the profession have for centuries been in the habit of giving quinine in one form or another to pregnant women indiscriminately, and if abortion had been produced it must have been noticed long ago. 3. That it seems established that quinine in full doses (gr. x.–xx.) is a very powerful stimulant to uterine contractions during labour. The pains it produces so exactly simulates the natural ones as to indicate that they are not so much caused by a specific action of the drug, as by its arousing the general nervous forces of the system. Be this as it may, adds Dr. Wood, most of the leading accoucheurs of this city (Philadelphia) and New York are accustomed to rely upon quinine in cases of uterine inertia from exhaustion." Dr. Monteverdi [1] regards it as preferable to ergot from its harmlessness both as regards mother and child, from the certainty of its action, and from the regularity and natural character of the pains induced. Four-grain doses he deems most appropriate. Within half an hour of its administration transient painless contractions ensue, which gradually become longer and stronger, intermitting like ordinary labour pains, and last about two hours. *In the Hæmorrhage of Pregnancy*, in *Amenorrhœa consequent on Torpidity of the Uterus*, and in *Puerperal Fever*, quinine, according to Dr. Monteverdi, proves useful.

Dose, of Sulphate of Quinine:—As a tonic, gr. j.–iij.; as an antiperiodic gr. iij.–x., or even gr. xx. *Of the Tincture*, ʒss.–ij. *Of the Wine*, ʒss.–j. *Dose of Hydrochlorate of Quinine*, gr. j.–x.

Other Preparations of Quinine. QUINOIDINE is a supposed uncrystallizable form of quinine contained in the mother liquors from which sulphate of quinine has been crystallized. According to Van Heijningen, it may be resolved into ordinary quinine, cinchonine, quinidine, and a resinous substance. (Pereira.) From it Liebig obtained his Amorphous quinine, which he considers bears the same relation to crystallizable quinine that barley-water does to sugar-candy. Dr. Garrod thinks amorphous quinine is closely allied to *Quinicine*, a substance isomeric with quinine, into which Pasteur found that the latter is changed when carefully heated in the form of a salt, as a tartrate. (Garrod.) The dose of amorphous quinine is gr. j.–x.

QUININÆ ARSENIAS. Arseniate of Quinine. A salt supposed to combine the antiperiodic properties of arsenic and quinine. Dose, gr. ¾–jss. in twenty-four hours, in divided doses.

QUININÆ ET FERRI CITRAS (*offic.*) (See FERRI ET QUININE CITRAS.)

QUININÆ VALERIANAS. Valerianate of quinine (Ph. D.) Antiperiodic and antispasmodic. Especially useful in *Intermittent Neuralgia*. Said to produce less disorder of the nervous system than the sulphate. Dose, gr. j.–iv., in pill or mucilaginous mixture. It is readily decomposed by acids.

[1] Practitioner, Oct. 1871.

Tartrate, phosphate, citrate, tannate, acetate, ferrocyanate, nitrate, and chlorate of quinine have also at various times been proposed as medicinal agents, but they do not appear to possess much advantage over the sulphate.

Remarks on the Administration of Sulphate of Quinine. 1. In all cases previous to its administration, it is advisable to give a purgative or emetic, or both, so as thoroughly to remove all crude matters or biliary accumulations from the alimentary canal.

2. The fluid form is the best, and its activity and certainty of operation are greatly increased by the addition of a few drops of Acid. Sulph. Dil. (one drop to each grain). Mr. Squire, however, recommends that when a large dose (gr. x.) is to be taken, it be merely suspended in water and not dissolved, as the bitterness is not then so intense.

3. Its action is rendered more certain and speedy by being given on an empty stomach.

4. When the bitter taste is objectionable, as in the case of young children, amorphous quinine, which is insoluble in saliva, but readily soluble in gastric juice, may be advantageously substituted.

5. To disguise its taste, it may be given in Infus. Rosæ Acid., which, although it produces a turbid and unsightly mixture, does not interfere with its operation. The same remark applies to strong coffee, which is a good vehicle for its exhibition.

6. When, from irritability of the stomach, it cannot be given by mouth, it may be advantageously administered in the form of enema, in two or three ounces of any bland fluid. Or it may be effectually applied endermically or hypodermically.

7. Combination with other remedies, particularly with opium, arsenic, or the sulphate of iron, appears greatly to increase its efficacy.

8. If, under its continued use, fulness of the head, or a buzzing noise in the ears, be experienced, the medicine should be discontinued.

9. When quinine fails, cinchona will sometimes prove effectual; or it may be advantageously replaced by arsenic, sulphate of iron, or some other anti-periodic.

10. It is advisable to continue its administration some time after the disease appears to be cured.

1895. *Therapeutic Uses.* *In Intermittent Fevers*, quinine may be regarded as almost a specific. When quinine fails, it will be generally found, on examination, that there exists hepatic or splenic congestion, or gastric derangement, all of which states interfere with the operation of this remedy. In such cases an active purgative, mercurial or otherwise, followed by taraxacum, with small doses of podophyllin, should be had recourse to, together with the free use of the potash salts, especially the acetate or citrate, or the chloride of ammonium, or other appropriate salines. When by the use of these means the complication is removed, the full powers of quinine will speedily manifest themselves. There is another class of intermittents over which quinine has little comparative influence—viz., those of long standing—chronic cases, where the malarious poison has become, as it were, engrained into the system, and manifests its presence periodically, week after week and month after month, uncontrolled by change of air and other measures. Here arsenic often succeeds where quinine fails. The two conditions essential to the success of quinine in intermittents are, 1, that they should be uncomplicated; and 2, that they should be of recent origin. These two conditions being obtained,

there is no remedy equal in efficacy to quinine. Great differences of opinion have been expressed as to the best mode and period of its administration. One class advocates the plan of giving it in a single large dose (gr. xv.–xx.–xxx.) immediately before an expected paroxysm; a second class, a similar dose immediately after a paroxysm, or towards the termination of the sweating stage; a third class advocates it in large doses, not only during the intermissions, but also during the hot stage of the fever; whilst a fourth limits its use to small repeated doses (gr. iij.–v.) during the intermissions alone. The last-named plan is the one followed out by the majority of practitioners (the compiler amongst others) with satisfactory results, but whether with a success equal or superior to the other methods, or with a less or greater expenditure of the drug (by no means an unimportant point) it is difficult to say. The mode of treatment advocated by Dr. Maclean appears very judicious, and in his hands has for years proved very successful. It consists in administering gr. xxx. in three equal doses during the period of intermission; the first dose in solution, with a few drops of diluted sulphuric acid, should be given towards the close of the sweating stage, and the last about, as far as can be calculated, an hour before the next anticipated paroxysm. Should there be much irritability of the stomach, it should be given in enema in doses of gr. xv. in place of gr. x. After the paroxysm has by this means been arrested, a moderate degree of cinchonism should be maintained for some days, by giving gr. iij.–iv. in solution every four hours. In cases where the fever returns at the first lunal period, as it is apt to do, the patient, a day or two previously, should be brought under the influence of quinine, which should be maintained till the time is past. Should it fail to control the fever, attention should be directed to the state of the viscera, &c. (*ante*). When from any cause it cannot be given internally, trial may be made with it applied endermically; the experiments of Dr. Guastamacchia and others tending to prove that it becomes absorbed into the system through the skin, and operates as an antiperiodic almost as certainly as when given internally. He dissolved gr. viij. in f℥ss. of spirit, and rubbed first one-half, and after the interval of a quarter of an hour, the second half, along the spine. When this was done at the commencement of the cold fit, it very often prevented even a single recurrence. Dr. Daunt also bears testimony to this method in the fevers of South America. The hypodermic plan will probably be found more effectual. Dr. Chasseaud found that one or two grains of quinine in alcoholic solution, injected into the cellular tissue of the arm, are equally if not more efficient in arresting fever than large doses given internally. Mr. W. J. Moore, of the Bombay Medical Service, also states that he has treated thirty cases of intermittent fever, and several cases of remittent, with invariable success, by the subcutaneous injection of quinine. He uses from f℥ss.–℥j. of the following solution:— ℞ Quininæ Sulph. gr. xxx., Acid. Sulph. Dil. gutt. viij.–x., Aquæ ℥ss. The time at which the injection should be made in intermittents is

before the expected cold fit. He believes that four or five grains thus used are equal in their effects to five or six times that amount taken into the stomach. The bulk required for injection is a great objection to this formula. The question of combination has in a great measure been overlooked in practice, yet it is certain that a combination of quinine and arsenic will sometimes succeed where each singly has previously failed; and I have sometimes thought that I have derived greater benefit from a combination of quinine and antimony than when the former has been given alone; and the same remark applies to its combination with sulphate of iron. In all cases the induction of cinchonism should be taken as a certain sign that the full physiological effects of the drug have been obtained; and if after its establishment the disease does not yield, to persist in its administration will be useless, and may prove injurious or even dangerous.

1896. *In Remittent Fevers*, quinine is a remedy of the highest value, but its exhibition requires more caution and discrimination than in simple intermittents. The plan propounded in 1847 by Mr. Hare, of the Bengal Medical Service, of administering it in scruple doses in all stages of the fever, even during the height of the exacerbations, has attracted much attention, and has had able advocates, but it has been condemned by Sir Ranald Martin, Dr. K. Mackinnon, and other experienced tropical authorities; and, as Dr. Morehead justly observes, the adoption of such a routine practice would certainly tend to favour superficial clinical observation. A more rational, and probably more successful mode of treatment is that advocated by Dr. Maclean. After premising, in most cases, a cathartic (*ante*), immediately on the first signs of remission, he administers a full dose of quinine, gr. x., often gr. xv., sometimes gr. xx., never exceeding that dose, and not deterred by the presence of headache or a foul tongue, nor because the remission is slight or imperfectly marked; and this dose he repeats every second hour until gr. xxx. or xxxv. have been taken before the hour of the expected exacerbation. Should the stomach be too irritable to bear it, it should be given in enema in large doses (gr. xx.). As soon as the second remission appears, it must be given as before until full cinchonism or distinct abatement of the disease occurs. During the remission the patient should have mild farinaceous diet, milk, chicken-broth, &c.; as soon as gastric irritability subsides, beef-tea should be given, and on the first sign of exhaustion, nourishment, and stimulants should be resorted to at short intervals. With regard to the administration of quinine during exacerbations, Dr. Maclean is of opinion that in the adynamic forms of fever, as met with in some parts of India, and in neglected or mismanaged cases, where depletion has been carried too far, and the fever assumes more of a low, continued type, it may be given at any period irrespective of remission. Here it requires to be conjoined with the assiduous use of support and stimulants at short intervals.

1897. *As a prophylactic of Malarious Fevers*, the power of

quinine has been variously estimated, but the facts adduced by Sir A. Bryson and Mr. L. J. Hayne with regard to its employment in one of the most intensely malarious portions of the globe—viz., the Western Coast of Africa—must be regarded as conclusive as to its possessing undoubted power in this respect. Further evidence to the same effect has been adduced by medical officers serving in the Crimea, and in various parts of the United States, and there can be no doubt that it should be resorted to by all who are exposed to malarious influence. Even if it fails, which it rarely does, no harm can result from employing it. The usual dose employed on the African station was gr. iv. in an ounce of wine daily during the period of exposure, and it is essential that it should be continued for at least fourteen days after quitting the malarious locality.

1898. *In Bilious Remittent, or Yellow Fever*, the *abortive* treatment, as it has been termed, which consists of the administration of one large dose (gr. xxx.–xl.) of quinine with morphine or opium at the outset of the disease, was introduced in 1837 by Dr. Thévenot, of Guadaloupe, and met with supporters in Dr. Blair, of Demerara, Dr. Harrison, of New Orleans, &c. Notwithstanding the lavish praises of these physicians, it failed in the hands of Drs. Van Buren, Fenner, and others. Dr. Stillé (i. p. 517) sums up the evidence *pro* and *con* in the following words:—"1. That quinine is not a specific for yellow fever, as it is for periodical fevers of every type. 2. That in mild cases, which would probably recover under good nursing and the expectant treatment, the medicine may sometimes hasten recovery. 3. That, on the whole, the results depending on quinine are no better, if indeed they are so good, as those of the treatment of symptoms sanctioned by general experience." This is perhaps a little too low an estimate of the powers of the drug, some of the evidence in favour of its powers being very strong.

1899. *In Typhus Fever*, cinchona was introduced in 1770 by Dr. Miller, and was subsequently recommended by Dr. J. Clark, &c. In 1851, Dr. Dundas, from a fancied analogy between typhus and intermittent fever, proposed the treatment of the former by large doses of quinine. Much difference of opinion has been expressed as to its powers. That it failed in the typhus of the Crimean war, where it was tried largely, is undisputed; and Dr. Murchison, who is unfavourable to its use, observes: "One thing is certain, that there is no proof that quinine can arrest the course of true typhus." The ill effects occasionally observed have been increase of coma and delirium, and great depression of the vital powers. *In Typhoid (Enteric) Fever*, Dr. Murchison speaks very favourably of quinine given as follows:—℞ Quininæ Sulph. gr. ¼–j., Acid. Sulph. Dil. vel Acid. Hydrochloric. Dil. ♏xv.–xxx., Syr. Aurant. f℥ss., Aq. Carui ℥j., which draught was ordered to be taken every three or four hours. Though it has no power to cut short the fever, yet, under its use, the febrile exacerbations become reduced in severity, the appetite improves, and the strength increases. Much of the benefit is pro-

bably due to the acid. *In the Typhoid Fever of Children*, Dr. Hillier states, that in moderately large doses quinine appears to be useful in reducing the intensity of the fever. It is recommended by Barthez and Rilliet. *In Puerperal Fever*, Dr. Cabanellas employed quinine in several cases with the best results. The reduction of temperature in this fever, according to Playfair (ii. p. 329) is best obtained by quinine in 10 to 15 grain doses night and morning. Under this, he says, the temperature frequently falls one or two degrees, and that it is not common for any head symptoms to follow its use.

1900. *In Scarlet Fever*, Dr. P. Hood has found the greatest service from the systematic administration of quinine from an early stage, its use being preceded by an emetic and a purgative. His testimony in favour of this treatment is very strong; he considers not only that it saves life, but that it prevents the occurrence of secondary affections, particularly renal dropsy. To act thus, however, its use must be commenced early. *In Scarlatinal Albuminuria*, it proved more successful than any other remedy, in the hands of Dr. Hamburgher. *In Otorrhœa and Ozœna following Scarlet Fever*, after the subsidence of all acute symptoms, quinine with sulphuric acid is advisable. In the former, warm-water injections and counter-irritation behind the mastoid process may also be employed. (Dr. Hillier.) Dr. Mouser considers that he has seen great benefit in *Smallpox* from the exhibition of quinine (gr. ij. every three hours) from the commencement of treatment until all febrile symptoms have subsided and desiccation is fully established.

1901. *In Influenza*, cinchona was formerly condemned in the early stages, but in some of the late epidemics quinine appears to have been useful throughout. It seems clear, however, that immediately the acute stage is passing off, quinine should be freely given. It does good service against the neuralgic pains which are often troublesome during convalescence. (Dr. Parkes.)

1902. *Periodical or Intermittent Diseases.* When any affection assumes a periodical type or character, particularly if there be reason to suspect a malarious origin or influence, quinine is indicated, and will be found efficacious, even when other circumstances might appear to warrant some other mode of treatment. *In Intermittent Angina Pectoris*, Dr. Forbes advises its employment. *In Spasmodic Asthma assuming a periodical character*, it often proves effectual. *In Intermittent Hemicrania, Headache, Brow Ague, Tic Douloureux, and other Neuralgic Affections*, it holds a foremost place in our list of remedies. *In Intermittent Hiccough*, it has also been used with success. Dr. Lohman mentions a case of *Intermittent Ophthalmia* which yielded to its use; and Sir B. Brodie found it effect a cure in a case of *Periodical Stricture of the Urethra*. *In Intermittent Hœmaturia*, large doses of quinine, with the use of occasional mercurials, have proved successful in the hands of Drs. Harley and Lionel Beale. *In Painful Uterine Neuralgic Affections*, when the pain is periodic, bark is of sovereign

efficacy, but it appears to do good in numerous cases where no such periodicity is observed. (Dr. Graily Hewitt.) *Hay Fever or Hay Asthma*, when it assumes a periodic form, usually yields rapidly to the exhibition of quinine. In all these cases the medicine should be administered during the intermissions.

1903. *In Neuralgias* of malarial origin, there can be no doubt of the value of quinine. It may be given in full doses (gr. v.–xx.) shortly before the time at which the attack of pain is expected; but if after three or four doses a decided improvement is not effected, the probability is great that the neuralgia is not malarial. In a certain number of non-malarial cases, also, quinine produces good effects: here, gr. ij.–iij. thrice daily, is the largest quantity which is likely to be of any use. Dr. Anstie, from whom this is quoted, adds, that he knows of no circumstances which indicate beforehand that quinine will be useful in non-malarial cases, except that it seems always more effective in neuralgia of the ophthalmic branch of the fifth, than in other non-malarial neuralgias.

1904. *In Acute Rheumatism*, the use of cinchona, introduced in 1772 by Dr. Haygarth, was followed by Dr. Lettsom, Dr. Heberden, Sir W. Farquhar, and others; but it fell into disuse until more recently, when the French physicians Drs. Briquet and Devergie re-introduced the mode of treatment, substituting quinine for the crude bark, prescribing the alkaloid in doses of ʒj.–ʒjss., in divided doses daily from the commencement of the attack. The results were stated to be highly satisfactory. It never appears to have been generally adopted in England. Dr. Fuller altogether condemns cinchona early in the attack; and even at a later period, while the tongue has continued furred and the pulse excited, he observed its use so constantly followed by a fresh accession of mischief, that he has been deterred from administering it until the urine has cleared, the pulse become soft, and the tongue moist and almost clean. Then, he adds, more especially in cachectic states of the constitution, or in persons who have been exhausted by the attack, it is often of essential service; but even then it must be carefully watched and at once abandoned, should any increased heat of skin, acceleration of the pulse, coating of the tongue, or loading of the urine indicate a recurrence of fever. In the majority of cases, quinine is earlier and more readily tolerated than bark, and as it is quite as efficient, it should have the preference when a tonic is indicated. It should be used as a corrective and restorative of the process of assimilation when the febrile paroxysm is beginning to abate, rather than as a cure during the active stages of the disease. (Dr. Fuller.) Dr. Winn details a case of *Rheumatic Pericarditis attended with delirium*, in which marked benefit was derived from quinine (gr. ijss. every 4 hours), combined with bicarb. of potash gr. xx. in mucilage. Dr. Nevins speaks highly of a combination of quinine (gr. ij.) and iodide of potassium (gr. v.) in the treatment of *Rheumatic Fever* from the outset of the attack, together with the use, twice weekly, of the vapour bath and subsequent cold douche.

1905. *In Enlargement of the Spleen*, especially when of malarial origin, or co-existing with intermittent fever, one of the most effectual remedies we possess is the sulphate of quinine, in doses of gr. xv.–xx. or more daily. M. Piorry advocated a theory that enlargement of the spleen was the proximate cause of intermittent fever, but this has been satisfactorily disproved by Dr. G. Smith of the Madras Medical Service, who out of 4,000 cases of well-marked ague was unable to detect any affection of the spleen except in a few rare instances. Dr. Smith carefully examined the action of quinine in 17 cases of enlarged spleen: of these the remedy failed in 6, and proved beneficial in 11; of the latter the effect was permanent in 7, and temporary in 4, the spleen in these last regaining its previous volume. It may be advantageously combined with sulphate of iron, and associated with active purgation.

1906. *In Phthisis*, cinchona long enjoyed the reputation of a specific. This opinion was supported by Morton, Sédillot, and De Metternich, while by others it has been prescribed only to answer particular indications. The supposition that it exerts any specific influence on the progress of phthisis is now entirely abandoned. Quinine is, however, a valuable tonic in that disease. It is advantageously given in doses of gr. j.–ij. in combination with sulphuric acid and the sulphate of iron, or in the form of citrate of iron and quinine. Cod-liver oil may be administered at the same time.

1907. *In the advanced stages of Pneumonia and Pleurisy*, when the patient is old, the constitution debilitated, and the case assumes a typhoid character, sulphate of quinine, in combination with sulphuric acid, may be given with great advantage. *In Gangrene of the Lungs* also, it often proves a valuable adjunct to other remedies. *In Asthenic Pneumonia*, the value of quinine is forcibly pointed out by Sir D. Corrigan. The general dose is gr. v. every third hour; under its use the pulse becomes slow and steady, and the respiration free. If the patient be young, with evidence of capillary congestion generally over the system, its use should be preceded by local depletion.

1908. *In Laryngismus Stridulus*, Dr. Merei states that, in six out of twelve cases in which he administered quinine, the effect was equally sudden and satisfactory. "It is chiefly useful," he observes, "in those weak and obviously nervous infants who suffer for weeks or months from fits, but who, during the intervals, are free from all disease." It should be given in the largest doses that the child can bear, and during the intervals of the paroxysms. *In Asthma*, Dr. Hyde Salter regards quinine as the best of all tonics, and next to this iron. He commonly uses, with the best effect, a combination of these two drugs, and a mineral acid. *In Hooping-Cough*, when the disease is protracted, and assumes an intermittent or periodic type, quinine or cinchona should never be omitted. In the second or spasmodic stage of hooping-cough, Dr. Lecarde speaks highly of the modifying influence of quinine. He

gives it in powder from gr. iij.–x. daily, according to the age of the child, each dose administered immediately after a paroxysm. The treatment of *Croup* by this agent is advocated by Prof. Eastman. He employs it in large doses, as there appears to be a great tolerance of the medicine. The only other measures he advocates are a full dose of calomel and a warm bath.

1909. *In Diphtheria* quinine is occasionally required. The special indications for its use are headache with high temperature, vomiting, and the symptoms of septic poisoning. Here it should be given in full doses, but discontinued if benefit fails to result in 36 or at most 48 hours. As a rule, however, quinine is more useful after the more serious symptoms have abated, when it may be very suitably combined with iron and a mineral acid. (Morell Mackenzie, p. 160.) As a local application it probably deserves more attention than has been paid to it. Speaking of its use in *Pseudo-membranous Ophthalmia* (*infra*), Mr. J. Tweedy[1] regards it as a specific in diphtheritic exudation, checking or controlling the inflammatory process, and limiting inflammatory neoplasms.

1910. *In Erysipelas*, cinchona should be given in all cases as soon as the tongue becomes clean and the skin moist; but it should be resorted to without delay if the pulse is soft, tremulous, or very rapid, the heat moderate, and the delirium low and muttering, or if suppuration or sloughing has commenced. (Druitt.) A combination of quinine and tincture of perchloride of iron seems to offer special advantages in these cases.

1911. *In Erythema Nodosum*, Sir T. Watson states that he has invariably found the disease yield to the exhibition of quinine preceded by an active aperient. Rest and the horizontal posture should be enjoined.

1912. *In Urticaria*, quinine often proves serviceable. I have found benefit from the following pills:—℞ Quininæ Sulph. gr. xij.; Pulv. Rhei gr. xxiv. To make twelve pills, of which one was ordered three times a day. It proves especially useful when the disease assumes an intermittent form. For the relief of intense *Pruritus accompanying Skin Diseases*, Sir E. Wilson has found quinine, in doses of gr. x. afford manifest relief. In one case it proved most beneficial given in a glass of sherry, every night at bedtime. It seems well worthy of a trial in obstinate cases.

1913. *In Scrofulous Ophthalmia*, the value of quinine is undoubted, and the earlier it is resorted to the greater will be the prospect of its success. Dose for a child gr. j., for an adult gr. ij.–iij. thrice daily. Careful regulation of the bowels, and nutritious diet, are at the same time requisite. Mr. H. Power[2] speaks highly of the value of a combination of quinine and Hyd. c. Cret. (gr. ij.–iij.) in these cases. *In Catarrhal Ophthalmia*, Mr. H. Hancock speaks highly of the value of cinchona with ammonia or quinine with or without opium, according to the intensity of the pain and irritability of the patient, associated with mild alterative aperients. He restricts local applications to warm water or

[1] Lancet, Jan. 7, 1882. [2] Practitioner, Oct. 1872.

poppy-head fomentations, to the exclusion of all local stimulants or astringents, which only serve to keep up the irritation. *In Granular Ophthalmia*, the local application of quinine in powder was used with advantage by Mr. C. Bader,[1] but it causes less pain and is equally effectual when applied in solution. The strength used by Mr. J. Tweedy[2] was gr. iv. of the sulphate with ℥j. of Acid. Sulph. Dil. to the ounce of water, and this he used with manifest advantage in *Pseudo-membranous* (*Diphtheric*) *Conjunctivitis*. He considers it acts specifically in these cases. (See Sect. 1909, Diphtheria.) *In Nyctalopia and Hemeralopia*, Mr. Howard, of Montreal, states that the treatment which he has found most effectual is, after the exhibition of a cathartic and emetic, to administer quinine in as large doses as the stomach can bear. *In Acute and Chronic Iritis*, he speaks highly of the value of the combination of calomel and quinine, the former being omitted when the gums become sore, but the latter to be continued.

1914. *In Insanity*, in cases where tonics seem to be demanded by the state of the bodily health—and they are the majority of cases at one period or other of their course—iron and quinine may be given, and one of the best ways of giving them is in a mixture containing quinine, tincture of perchloride of iron, and chloric ether. (Dr. Maudsley, ii. p. 61.) Prof. Van der Kolk, however, prefers arnica root in these cases: with this he considers cinchona superfluous. *In Puerperal Insanity*, if the skin be relaxed and there exist a disposition to free and copious exudation, quinine with mineral acids in considerable doses will be of service. (Dr. Prichard.) *In Delirium Tremens*, the nervine tonic on which Dr. Anstie (ii. p. 87) reposes the greatest confidence is quinine, in doses of gr. j. twice or thrice daily. It should be given from the very first, if possible, and this may be done when the stomach is very irritable, by administering it in effervescence, with bicarbonate of potash and citric acid. Nothing, Dr. Anstie adds, has been more marked in his experience than the superior efficacy of direct tonics, and especially of quinine, in producing that nervous tranquillity which makes sleep possible. When this fails, he advises sulphuric ether ℥xxx. thrice daily, or a single dose of ℥lx. at bedtime, with ℥xxx. of tincture of sumbul. *In Headaches, associated with Hysteria and Anæmia*, Dr. Graily Hewitt (p. 385) regards bark, in the form of liquor cinchonæ, as a valuable remedy.

1915. *In Epilepsy*, cinchona was prescribed by Home, and others; and, in *Chorea*, it has also been employed in some instances with advantage. It has been conveniently replaced by quinine, which may prove serviceable when judiciously administered. It is chiefly indicated when the disease is of a purely nervous character, or when it assumes a periodic character, when the powers of life are much depressed, and there is much exhaustion of the nervous energy. In these cases Dr. Brown-Séquard prescribes quinine in large doses (grs. v.–x.–xv.) at intervals, just before the fit is ex-

[1] Lancet, Oct. 28, 1871. [2] Lancet, Jan. 7, 1882.

pected. By this means, he states, the fit is frequently prevented, and the patient goes on to the next or even to a longer period. It is inadmissible until the bowels have been freely evacuated, when there is much gastric irritation, or a plethoric condition of the brain, or of the system generally. Under the circumstances above indicated, it may be advantageously combined with the sulphate of iron. Some cases of *Tetanus* are on record, which apparently yielded to quinine, but the evidence of its utility is very inconclusive, and as far as is known it is less effectual than Calabar bean and many other remedies.

1916. *In Gangrene and Mortification*, cinchona has long been held in high esteem, and when these states are attended with great prostration of the vital powers, a debilitated state of the constitution and general cachexia, or typhoid symptoms, its internal exhibition is followed by the best effects. It is not applicable to all cases, particularly when the digestive organs are much deranged. As a general rule, the decoction of cinchona, with a small portion of the mineral acids, has a better effect than quinine; but there are exceptions to this rule, as, for instance, when the digestive organs are impaired, and unable easily to bear the quantity of bark which it is necessary to exhibit in order to produce a constitutional effect. Quinine may then be advantageously substituted.

1917. *In Cancrum Oris*, the constitution requires tonics and stimulants in order to support the strength. Dr. Graves strongly recommends quinine, either in the form of enema, or made into a syrup, and flavoured with diluted sulphuric acid. *In Aphthous Ulcerations*, when the constitution is much debilitated, it also proves highly serviceable.

1918. *In Scurvy, attended with much prostration*, quinine may be given with great advantage. Much evident improvement follows its use, particularly when given with the mineral acids. It need not interfere with the use of lemon-juice, or other antiscorbutics. A decoction or the diluted tincture of cinchona forms a very useful gargle; myrrh or the chlorates may be conjoined with it.

1919. *In Pyœmia* in childhood, Dr. Hillier states that he knows nothing in the way of drugs that will do good except quinine, in large doses carried to cinchonism. Plentiful nourishment, with wine and good ventilation, are points not to be neglected.

1920. *In Malarial Dysentery*, quinine in full doses should be given, not less than a scruple in solution, some time before commencing ipecacuanha, which should be given as laid down in that article, and it should be repeated until cinchonism is induced: the two drugs should then be given in alternate doses until the characteristic effects of both are produced. (Dr. Maclean.) *In Diarrhœa*, of malarial origin, or when it assumes a periodic type, quinine is indicated, and in such cases is best given in combination with an excess of sulphuric acid, and with opium. *In Infantile Cholera*, the citrate of iron and quinine has often been found of the greatest service. *In Cholera*, quinine has been advocated by Dr. Bell and

others, both as a curative and as a prophylactic agent, but it does not appear to be a remedy on which reliance is to be placed. It is, however, a valuable tonic in convalescence after this as well as other exhausting diseases.

1921. As an *Anthelmintic*, especially in cases of *Ascarides lumbricoides*, the value of quinine has been pointed out by Dr. Delvaux. For children between two and ten years of age, the dose ranges from gr. iij.–vj.; for adults, gr. ix. in the twenty-four hours. Injections containing the sulphate, every evening, he found effectual in removing thread-worms from the rectum; and he likewise mentions two cases in which tænia were expelled under its use. As far back as 1764, Van Doeveren, of Gröningen, pointed out the anthelmintic properties of cinchona.

1922. Resorcin. An hydroxyl derivative of Benzine; it exists in white crystalline plates like Benzoic Acid.

Med. Prop. and Action. Resorcin was discovered by Hlasiwetz and Barth. It melts at 110° F. Is soluble in two parts water, 20 of oil, also in ether, alcohol, glycerine, and vaseline. A strong antiseptic, 1 per cent. checks putrefaction, 1·5 per cent is germicidal, and coagulates albumen. Toxic doses produce tremors, clonic convulsions, accelerations of respiration and pulse, sensibility and consciousness are at first unaffected, finally vertigo, loss of consciousness, tetanic convulsion supervene, and death ensues. The temperature at first unaffected, finally rises. It is rapidly eliminated by the urine, which it darkens.

Resorcin was introduced by Dr. Andeer, of Würzburg, as an antiseptic. It is prepared from resins, and chiefly from galbanum. It is bitter-sweet to the taste, and smells not unlike carbolic acid. It acts as a caustic, by virtue of its power of coagulating albumen. It checks fermentation (1 per cent.) and in stronger solutions destroys fungus forms. Andeer found resorcin prevented putrefaction when added to animal fluids, such as blood, pancreas infusion, &c. Resorcin also possesses marked antipyretic properties; they are slighter in proportion as the disease shows natural tendency towards remission. Thus, the fall of temperature was less in pneumonia than in typhoid. The patient, after taking from gr. xxx.–xlv., begins to perspire in a quarter of an hour. Flushing of the face, tinnitus aurium, giddiness, acceleration of pulse, and respiration occur. (Lichtheim.)

Toxic effects. One case recorded by Dr. Murrell[1] shows a striking similarity in the symptoms elicited (3ij. were given at once) to those of carbolic acid poisoning. There was insensibility, coldness of the extremities, collapse, the pulse weak, profuse perspiration, extreme pallor, dryness of lips, the pupils were equal, but no paralysis existed. As to antidotes, the administration of oil, followed by stomach-pumping and an emetic, is probably best. Alkalies and sulphate of sodium, red wine, and albuminate of iron have all been suggested. Dr. Murrell advises a hypodermic injection of atropine if the collapse be profound.

Administration and Dose. It is well taken in syrup of orange, in doses of gr. v.–xv., but as an antipyretic 3j. may be given, its effect being carefully watched.

1923. *Therapeutic Action.* As an *antipyretic in Fevers*, resorcin seems less powerful than quinine. It reduces temperature, doing so in proportion to the diaphoresis it occasions, but unless the dose is repeated the temperature rapidly runs up again. As a rule, repetition of the dose is followed by no unpleasant consequences,

[1] Med. Times and Gaz. Oct. 22, 1881.

but delirium and tremor may occur. It seems to have no specific action, simply controlling the pyrexia. *In Intermittent Fevers*, however, some authorities lean to the view that resorcin is a specific similar to, but less powerful than, quinine. The urine of the patient treated with resorcin assumes a dark colour, not unlike that of carboluria. Dr. Dujardine Beaumetz has not obtained the same results as those of Lichtheim, resorcin having failed in his hands as an antipyretic. He employed much smaller doses.

1924. *In Gonorrhœa and Purulent Vaginitis*, a 1 per cent. solution is useful as an injection. Leblond and Fissiaux prefer it to iodoform as a local application to *Soft Chancres*, curing in twenty-three days.

1925. As a *Dressing for Wounds*, and also for the *Ulcers of Syphilis*, *Scrofula*, &c., resorcin (50–70 per cent. in vaseline) is useful.

1926. *In Hooping-cough*, Moncorvo states that resorcin acts as a specific, destroying the micro-organisms upon which the disease is believed to depend. A 1 per cent. solution must be painted over the epiglottis, and even in the larynx.

1927. *In Vesical Catarrh*, 5 per cent. solutions are said by Andeer to do much good when injected into the bladder. He has used a 10 per cent. injection with good results.

1928. Locally applied in *Erysipelas*, *Scarlatina*, *Variola*, *Pemphigus*, *Rupia*, and *Lepra*, it gives satisfactory results. It is said to heal without giving rise to cicatricial tissue, the epidermis being regenerated.

1929. As a wash for the cavities of *Chronic Abscesses*, (? *empyemata*) resorcin is said to answer well; it has at present been little, if at all, used for *Intra-thoracic Injection*. While most of the mucous membrane lined cavities bear resorcin well, the uterus is very intolerant, so that care has to be taken in its employment in *Endometral Affections*. Its marked antiseptic properties have led to its use in surgery.

1930. *In Asthma*, Dr. Murrell has employed resorcin and has found in some cases it brought relief after the failure of all other remedies.

1931. RHAMNI FRANGULÆ CORTEX. Frangula Bark. Black Alder. The dried bark of Rhamnus Frangula, *Linn.*

Med. Prop. and Action. Tonic, laxative. It occurs in small quills. These quills, which should not be used until a year old, are covered with a greyish brown corky layer, the inner surface is smooth and brownish-yellow. Frangula bark has no odour, its taste is not unpleasant, being sweet, with an after bitter taste. It was introduced into the B. Ph. 1885, and two preparations —an Extract and a Liquid Extract—made officinal.

Dose:—Of the Extract, gr. xv.–lx. *Of the Liquid Extract*, 3j.–iv.

1932. *Therapeutic Uses. In Constipation*, Frangula bark is peculiarly useful. The action is mild, free from griping or sickness, and even when taken frequently it does not lose its power, nor require an increase of the dose. In cases such as when

hæmorrhoids are present, when it is desired to keep up a laxative action for some while, Frangula possesses peculiar virtues. It is very superior to the Rhamnus Catharticus, the common or purging buckthorn, and has supplanted that plant in the B. Ph.

1933. RHAMNI PURSHIANI CORTEX. Cascara Sagrada, Sacred Bark. The dried bark of Rhamnus Purshianus, *D.C.*

Med. Prop. and Action. The bark occurs in quills and incurved pieces of varying lengths and sizes. It is free from odour or taste. The bark was made officinal in 1885, and two preparations introduced into the B. Ph., the Extract and Liquid Extract. Cascara Sagrada is a tonic, stomachic, and, in large doses, cathartic. It is supposed[1] to act upon the muscular tissue of the intestines through the sympathetic fibres which supply the muscles, and so to increase peristaltic action.

Dose:—Of the Extract, gr. ij.–viij. *Of the Liquid Extract*, ʒss.–ij.

1934. *Therapeutic Uses. In Habitual Constipation*, Cascara sagrada is a very useful remedy. It is best given in the form of the liquid extract, ♏xv. or xx. three times a day before meals. It usually is mildly laxative in these doses, giving rise to no pain or inconvenience. Mr. Emilius Thompson[2] gave the fluid extract in over three hundred cases in which constipation was the troublesome symptoms, and reported that in most cases under its use the action of the bowels became regular, while no unpleasant symptoms occurred. He recommends the following formula:—℞ Extr. Cascaræ Sagradæ, gr. j.; Extr. Berberis Aquifolii, gr. ij.; f. pil., and directs that one pill should be taken night and morning. This pill may be continued for months without losing its efficacy, or even requiring an increase in the dose of the Cascara; on the other hand Mr. Thompson found the liquid extract when continued for some time ceased to act so effectually, unless increasing quantities were employed. In a few rare instances, severe griping, purging, and vomiting are caused by even small doses of Cascara, so that it is wise to employ smaller doses than those advised in the B. Ph., at all events in the first instance. Children take this medicine well. In all cases of *Dyspepsia*, associated with *Torpidity of the Liver* and *Constipation*, it is well to commence with a small dose (♏xx.–xxx.) for an adult, and if necessary increase it. Cascara appears to resemble nux vomica in its action upon the muscular structures of the intestines, and hence would seem to be indicated in all *Atonic Conditions of the Intestines*, when constipation is determined by a deficient peristalsis.

1935. RHEI RADIX. RHUBARB. The dried root of Rheum palmitum, *Linn.*, and other species.

Med. Prop. and Action. Stomachic: primarily cathartic, secondarily astringent. As a cathartic it operates more by increasing the muscular action of the intestines than by augmenting their secretions. It is usually considered to act upon the whole course of the intestinal canal, and especially upon the duodenum. By some it is also thought to increase the biliary secretion, but this is very doubtful. Its cathartic action is followed by a considerable

[1] Brit. Med. Journ. March 1883. [2] Brit. Med. Journ. March 1884.

amount of astringency and constipation, so much so, as to have acquired for rhubarb the reputation of being secondarily a calmative, as well as directly a stimulant of the intestinal canal. At the same time it exercises a tonic action on the stomach, indicated by improved appetite and digestion. In the course of its operation it is absorbed into the system and communicates a red colour to the urine which might be mistaken for hæmorrhage, but it may be distinguished by the application of heat, which coagulates blood, removing the red colour, but does not affect the tint communicated by the drug. (Christison, p. 787.) The milk of a nurse under the operation of rhubarb, is rendered purgative. That it exercises a specific action on the intestines is proved by the fact, that a rhubarb cataplasm applied to the abdomen produces a brisk purgative effect. (Alibert.) Its cathartic operation is increased, and its subsequent astringent effects apparently diminished, by combining it with the carbonated alkalies. Its purgative principle has not been isolated. From the mildness of its operation, it is well adapted as an aperient in childhood and the puerperal state.

Dose:—Of Powdered Rhubarb, gr. iij.–vj. as a stomachic; gr. x.–xxx. as a cathartic. *Of the Extract*, gr. iij.–viij. as a stomachic; gr. x.–xx. as a cathartic. *Of the Infusion*, f℥j.–ij. *Of the Tincture*, ℥j.–ij. *Of the Wine*, f℥j.–ij. *Of the Syrup*, f℥j.–iv. *Of the Compound Pill*, gr. v.-x. *Of the Compound Powder—Gregory's Powder*, gr. v.-x. for children, gr. xx.-lx. for adults.

1936. *Therapeutic Uses. In Dyspepsia*, rhubarb proves highly serviceable, being warm and carminative in its nature, speedy in its action, and neither stimulant nor drastic. It was highly esteemed by the late Dr. M. Baillie, who advised gr. viij., made into pills with soap, to be taken every night at bedtime, together with some mild bitter infusion, and an alkali in the daytime. This, he states, if persevered in, proves more beneficial that any other remedy he knows of. Where acidity of the stomach is a prominent symptom, the following will often prove useful. ℞ Rhei Rad. Contus. ℥jss., Potass. Carb. ℥iij., Aq. Ferv. ℥xij. M. Macerate for twelve hours, strain and add T. Cinnam. f℥ij. Dose, f℥ss.–ij. An old plan of administration, but one which often proves highly useful, is for the patient to chew a piece of solid rhubarb.

1937. *In the Constipation of Children*, rhubarb, conjoined with magnesia, is a popular aperient; but it is objectionable on account of its subsequent astringency. *In Habitual Constipation*, a pill of moderate strength (Pil. Rhei Co. vel Pil. Coloc. Co. vel Aloes gr. ij.–iij., Pulv. Capsici. gr. j.) *taken with the food*, and repeated daily as occasion may require, produces the best effect. *In the Puerperal state*, gr. xx.–xxx., in some aromatic water, with or without a few drops of laudanum, is a good aperient.

1938. *In Diarrhœa*, rhubarb often proves highly useful. After removing any crude or irritating matters from the intestines by its purgative property, it acts as an astringent and tonic, and is often by itself sufficient to effect a cure. A good formula for general use is the following:—℞ Pulv. Rhei Co. ℥j., Sodii Carb. gr. xx., T. Opii ♏x.–xv., Aq. Menth. Pip. vel Aq. Anethi ℥x. To be taken as a draught. After its operation, should the diarrhœa continue, chalk mixture and opium may be given. *In the Diarrhœa of Children*, Dr. West states that he has found the following more generally useful than any other remedy:—℞ T. Rhei ℥ij., Magnes. Sulph. ℥j., Syr. Zingib. ℥j., Aq. Carui ℥ix. M. Dose, ℥j. thrice

daily for a child aged one year. In the diarrhœa attendant on dentition he prefers ipecacuanha (*q.v.*). The astringency of rhubarb is increased, and its purgative power decreased, by the process of roasting. Mr. Hoblyn directs it to be burnt in an iron crucible, until it loses two-thirds of its weight, and then to be given in doses of gr. v.–x. when necessary. In the *Diarrhœa of Phthisis*, he found it more useful than chalk or opium.

1939. *In Gout*, rhubarb taken regularly during the intervals, proves highly serviceable; often, apparently, warding off an attack. At the period of an impending paroxysm, Sir H. Halford states that he has had incomparably the most satisfaction in giving a few grains of rhubarb, and double the quantity of carbonate of magnesia, every day, either at bedtime or early in the morning; or, under evident weakness of the powers of digestion, fʒss. of the compound tincture, with gr. xv. of carb. of potash in some light bitter infusion daily, before the principal meal. For the same purpose, Dr. Graves advises the following mixture:—℞ Aurant. Cort. ʒij., Pulv. Rhei ʒj., Pulv. Aloes c. Canellâ (D. Ph.) ʒij., Spt. Vin. Gallici Oiv. M. Dose, a tablespoonful of the strained liquor in water, night and morning.

1940. *In Urticaria*, rhubarb, from its carminative property, is the aperient which is most indicated, particularly when the disease occurs in young females. The following draught is an eligible form of administration:—℞ Pulv. Rhei, Mag. Carb. āā gr. x.–xv., Spt. Ammon. Aromat. ♏xx., Aq. Cinnam. ʒjss. *In the Aphthæ of Children*, a similar formula, in small doses, proves highly serviceable.

1941. RICINUS COMMUNIS, *Linn.* Castor Oil Plant.

Med. Prop. and Action. The seeds are powerfully acrid and purgative; and in large doses, an acro-narcotic poison, twenty of them having proved fatal. They abound in a fixed oil (*infra*). In appearance they closely resemble the tick; hence their name, *Ricinus*, the Latin term for that insect. They are not used in medicine in their natural state. *The leaves*, according to Dr. McWilliam, are used by the women of Western Africa *to increase the secretion of milk*. He states that a decoction is made by boiling a handful of the plant in Ovj.-Oviij. of water; with this the breasts are bathed for fifteen or eighteen minutes; part of the boiled leaves are also spread over the breasts; a copious flow of milk generally follows in a few hours. This statement is verified by Dr. Tyler Smith, who also found it act successfully as an emmenagogue, in a case of *Amenorrhœa*. Dr. Routh prescribes a decoction of the leaves internally, as a galactagogue, and states that, when thus taken, it has the effect of increasing in a marked degree the secretion of milk.

1942. RICINI OLEUM. Castor Oil: the oil expressed from the seeds of Ricinus communis (*ante*).

Med. Prop. and Action. Castor oil is one of the most valuable purgatives in the Materia Medica. The cold-drawn oil is particularly mild, and is well adapted for children, for *the Puerperal state, Inflammatory conditions of the Alimentary Canal, or of the Genito-urinary Organs, and after Operations.* In doses of fʒss.–ʒj., it produces two or three stools in the course of three or four hours, without griping or uneasiness. The great objection to it is its nauseous taste; to disguise this it is best given floating on strong coffee, milk,

or some aromatic water. Made into an emulsion with mucilage, flavoured with the juice of a lemon, and ʒss. of T. Cardam. Co., its taste is effectually disguised. It may be administered in capsules. One of the great advantages of castor oil is, that it leaves very little, if any, subsequent constipation. That it acts specifically upon the mucous membrane of the intestines is shown by the fact that, when injected into the veins, or rubbed on the abdomen, it acts as a purgative. In some persons it causes vomiting, but this is more the effect of its nauseous taste than of any inherent emetic property.

Dose, fʒj.–fʒj. or more.

1943. *Therapeutic Uses. In Dyspepsia*, attended with inflammation or vascular excitement of the pylorus and duodenum, there are some medicines which appear to exercise a direct antiphlogistic effect upon the mucous membrane of the intestines. At the head of these, Dr. T. J. Todd places castor oil, in doses of ʒj. daily. If its soothing and antiphlogistic effect be desired, it is best given at bedtime; if its aperient action, in the morning. The effects of castor oil upon the stomach afford a very good test of the nature of the morbid condition of its mucous membrane. In atonic dyspepsia, it is borne with the greatest difficulty, producing nausea and vomiting; in purely irritable dyspepsia, a small dose of castor oil acts severely, and with much griping; but if there be any degree of vascular excitement of the mucous membranes, it soothes and quiets, and it is often most useful in this way when it has no aperient action. It may be given in any mild carminative water, in emulsion, in coffee, or by combining it with a little liq. potassæ. It is one of the most eligible aperients in *Gastric Ulcer*, when this class of medicines is required. A moderate dose (ʒvj.–viij.) can often be taken in the ordinary way, without at all increasing the pain or vomiting; but when the latter is of frequent occurrence, it is better to administer it in the form of enema.

1944. *In Colic*, when the stomach is not too irritable to bear it, castor oil is often productive of great benefit. In doses of fʒj.–ij., with gutt. j.–ij. of Ol. Menth. Pip. and ♏x.–xx. of T. Opii, it generally affords great relief; even in *severe Ileus, and in the dry Belly-ache of the West Indies*, it has been found of great service. A full dose, fʒj.–ʒjss., may also be given as a purgative, with or without the oil of turpentine.

1945. *In Cholera*, "the evacuant system," introduced by Dr. G. Johnson,[1] consists in the administration in the early stage of the attack, of a mild purgative, castor oil *par excellence*, with the view of aiding the existing diarrhœa, which he regards as the mode adopted by Nature for removing from the system the irritant or morbific matter. To this end he administers as early in the premonitory diarrhœa as possible, a tablespoonful of castor oil in a mixture of orange or lemon juice and water, or cold water, or other convenient vehicle; should this be vomited, it should be immediately repeated, and the patient directed to lie still and take no more liquid for half an hour, by which time the oil will have passed from the stomach into the bowels. Within an hour or two the oil will usually have acted freely. Then a tablespoonful of

[1] Med. Times and Gaz. Sept. 9, 1854.

brandy is given in thin arrowroot or gruel, and if there be much feeling of irritation with a sense of sinking, gutt. v.–x. of tincture of opium in cold water. These means, it is stated, will suffice for the speedy arrest of most cases of *Choleraic Diarrhœa*. If objections exist to castor oil, gr. xv. of powdered rhubarb, or f℥ss. of tincture of rhubarb, or a teaspoonful of compound rhubarb powder may be substituted for it. If with the diarrhœa there be vomiting, it is directed to be encouraged and assisted by copious draughts of tepid water; if there be nausea without vomiting, especially if the stomach is supposed to contain undigested or unwholesome food, or morbid secretions, an emetic is advised—*e.g.*, ipecacuanha gr. xx. —or a teaspoonful of mustard, or a tablespoonful of common salt. The theory on which the whole of the treatment is based, is that Nature, by the operation of purgation and emesis, is endeavouring to eliminate from the system the morbific matter, and the more effectually we aid this, having regard, of course, to the patient's strength, the greater will be the chances of cure. To this theory there are many grave objections, but the success reported to have attended the practice in the hands of Drs. M'Cloy and Robertson, and the public adhesion given to it by Sir T. Watson,[1] in addition to Dr. Johnson's own testimony,[2] cannot fail to have weight with many. Those, however, who have had most experience of the disease in India, continue to regard the astringent as more effectual than the evacuant system. It should be added, that when the diarrhœa has continued for some hours, and there is reason to suppose, according to Dr. Johnson's view, the morbific agent has already purged itself away, the castor oil is not given, but recourse had at once to the brandy in arrowroot and laudanum as above directed; but Dr. Johnson lays it down as a rule not to give opium until the morbid poison and its products have for the most part escaped.

1946. *In habitual Constipation*, there is no purgative equal in efficacy to castor oil. It operates speedily, without much griping, and causes less subsequent constipation than any other purgative to remedy this state. It is well adapted for children, and for women during pregnancy.

1947. *To Bed-sores occurring in Typhus and other Fevers*, an excellent application is composed of two parts of castor oil and one of balsam of Peru spread on pieces of lint, which are laid on the sore, and covered with a linseed poultice, to be changed three or four times a day. (Murchison, p. 286.)

1948. ROSMARINUS OFFICINALIS, *Linn.* Common Rosemary.

Med. Prop. and Action. The tops are stimulant and carminative, which qualities depend upon the presence of a volatile oil (*off.*), which, in doses of ♏iv.-v., is the best form for internal administration. In addition to this they contain tannin and a bitter resin. The Spirit is chiefly employed for the sake of its odour in lotions and other external applications.

1949. *Therapeutic Uses. In Hypochondriasis, Nervous Headaches, and Hysteria*, infusion of rosemary was formerly held in

[1] Brit. Med. Journ. July 18, 1868. [2] Loc. cit.

high esteem. As a mild stimulant, it may occasionally prove beneficial. It was also employed in *Amenorrhœa and Chlorosis*, but it appears to exercise no specific action on the uterus.

1950. *In Alopecia or Baldness*, the volatile oil, diluted with some bland fixed oil, has been advised as a stimulant liniment. I have seen apparent benefit from the daily use of an infusion, *in preventing the hair falling off after fevers and debilitating diseases.*

1951. RUTA GRAVEOLENS, *Linn.* Common Rue.

Med. Prop. and Action. The leaves are stimulant, narcotic, and irritant. They contain a volatile oil (Oleum Rutæ), which renders them so acrid, that when they are rubbed on the skin they cause great irritation and inflammation. Internally, the oil may be given. From the experiments of Dr. Helie,[1] rue appears to exercise a direct influence on the uterus, independent of its irritant and narcotic effects on other parts of the body; and also to have a remarkable power of diminishing the activity of the heart and arterial system, the pulse in one instance falling thirty beats in a minute; and in England rue is occasionally used with a view to produce abortion. Anthelmintic virtues are also assigned to it.

Dose:—Of the Volatile Oil, ♏ij.-v.

1952. *Therapeutic Uses. In Amenorrhœa, Chlorosis, and other Uterine Affections*, rue has been held in high esteem for many centuries, but its efficacy is very doubtful. It should be given in combination with other emmenagogues.

1953. *In Hysteria and Flatulent Colic*, the volatile oil (♏ij.-v.) or an infusion of rue, is a popular and efficacious remedy.

1954. SABADILLA. Cevadilla. The dried ripe seeds of Schnœnocaulon officinale, *A. Gray* (Asagræa officinalis, *Lindl.*).

Med. Prop. and Action. Acrid poison, its activity residing principally in the alkaloid *Veratria*, of which it is the officinal source. It likewise contains another principle, *Sabadillina*, which differs from veratria in being insoluble in ether, and according to Dr. Turnbull,[2] who has paid much attention to this drug, it is inferior to it in activity. It proves rapidly fatal to pediculi—hence one of its vulgar names, "lice seeds." It has also been well reported of by Dr. Cazin and others as a tænicide, but there are other safer and more effectual remedies of the same class. Even applied externally it is objectionable, in consequence of the danger of its active principle, veratria, becoming absorbed into the system. Every benefit which could be expected from it may be derived with greater certainty and safety from veratria (*q.v.*).

1955. SABINÆ CACUMINA. Savin Tops. Savin. The fresh and dried tops of Juniperus sabina, *Linn.*

Med. Prop. and Action. Stimulant and emmenagogue. They may be given in infusion, but the essential oil, upon which the activity of the plant depends, is the most certain and efficacious form for internal use. Savin appears to operate powerfully on the uterus, and has been frequently employed criminally for procuring abortion. When thus taken in large doses, it has caused inflammation and death. Great caution is necessary in its exhibition. The bruised leaves, in the form of ointment, are much employed in keeping open blistered surfaces, setons, &c. For these purposes it should be freshly prepared, as it soon spoils in hot climates. It has been considered vermifuge.

1 Med.-Chir. Rev. vol. lviii. p. 604. 2 Med. Prop. of Ranunculaceæ, p. 7.

Dose:—*Of Savin Tops*, gr. iij.-x. in the form of infusion; rarely thus employed. *Of the Volatile Oil*, ♏j.-v. *Of the Tincture*, ♏xx.-lx. *Prep. for external use only*: *Ointment.*

1956. *Therapeutic Uses.* *In Amenorrhœa*, the influence of savin has long been known. Dr. Home,[1] of Edinburgh, who employed it successfully, observes that it is chiefly useful in those cases which are unattended by fever, and in which the circulation is languid; but that it is inadmissible in plethoric states. Dr. Tilt speaks of savin as "the most reliable of a very uncertain set of remedies," and he states that he has never seen ill effects, though he has given gutt. xx. of the oil twice daily. He advises the following mixture:—℞ Ol. Sabinæ ʒj., Sp. Æther. Nit. ʒiij., Mucilag. ʒj., Aq. ad ʒvj. M. Dose, a teaspoonful every two hours, the bottle having been previously shaken. He likewise advises a plaster containing the oil to be worn over the ovarian region. Prof. Van der Kolk states that he has not seen a single definitive result from the use of savin in these cases.

1957. Saccharum Purificatum. Refined Sugar. Pure cane sugar, prepared from the stem of the Sugar-cane.

1958. Sacchari Fæx. Theriaca. Treacle. The uncrystallized residue of the refining of sugar.

Med. Prop. and Action. These articles, the products of Saccharum officinarum, are of great importance in medicine, pharmacy, and domestic life. The following are some of their medical uses:—*In Poisoning by the Salts of Copper, Mercury, Silver, Gold, Lead, and Arsenic*, sugar proves useful, partly, according to Orfila, by acting chemically, and partly by increasing the peristaltic motion of the bowels. Dr. Pereira regards it solely as a mechanical antidote. 2. *In Burns*, Dr. Payne, of Nottingham, states that he has employed treacle for above twenty years, and with great success. It is applied pure to the injured surface, and at the natural temperature, folds of well-aired linen being laid over it, and the dressing allowed to remain on for three or four hours at first; the dressings subsequently require to be removed once or twice daily. Dr. Payne considers it the best application we possess; and adds, that it acts by effectually excluding the air, and by abstracting the morbid heat of the part, thus proving at once sedative, refrigerant, and healing. 3. *In the Stings of Wasps*, it is a common practice with the labourers at sugar manufacturies in the East to apply immediately a little brown sugar to the spot. It is stated to afford almost immediate relief. 4. *To exuberant Granulations and Indolent Ulcers*, a little finely powdered white sugar, sprinkled over the surface, is occasionally used with advantage, but it causes much irritation. Sugar has been proposed by Dr. Lücke Fischer,[2] of Strasbourg, as an antiseptic dressing for wounds. It is well spoken of in Germany. It should be used with equal parts of naphthaline or (5–1) iodoform. 5. *As an article of Diet in Diabetes Mellitus*, sugar has been advised by Dr. W. Budd, who furnishes a case illustrative of the benefit to be derived from it; but it signally failed in the hands of Drs. Williams, Bird, and Bence Jones, and is condemned by Dr. Pavy. 6. Drs. Behrend and Sieber recommend sugar as of great value in *Diarrhœa and other affections of Children*, and they relate two cases of diarrhœa in which ʒss. of powdered white sugar given every hour soon gave a favourable turn to the symptoms, which had long resisted all the ordinary means of cure. In some cases, when there is an evident putrefactive tendency in the alvine secretions, it promises to be a remedy of great value. 7. *As an article of diet in Phthisis*, Dr. Symonds speaks favourably of the action of sugar taken to the extent of ¼lb. or more

[1] Clinical Experiments, p. 387. [2] Centrallb. f. Chir. p. 34.

daily. He mentions a case in which marked temporary benefit followed its use. He regards it, with eggs, a succedaneum for cod-liver oil, when from any cause the latter cannot be taken. 8. *As a collyrium in "Glandular Lids,"* Mr. Tait has obtained excellent results from dropping between the eyelids occasionally, as often as they felt uneasy, a little simple syrup made of the best sugar and filtered quite clear. It was of such a strength that it did not deposit sugar, about ʒiij.-iv. to water ʒj. In some cases it seems to aggravate the symptoms, but the benefit is not generally long in being manifested. Dr. J. A. T. Aitchison bears strong testimony to the value of a solution of sugar (ʒj.–ʒiij.) in the *Ophthalmias of India.*

1959. Salicis Cortex. Willow Bark. The bark of Salix alba, *Linn.*, and other allied species.

Med. Prop. and Action. Tonic, astringent, and antiperiodic. Its tonic and antiperiodic powers reside in a crystalline principle, *Salicin:* its astringency is due to a small proportion of tannin which it contains.

1960. *Therapeutic Uses.* See Salicylic Acid and Salicin.

1961. Salicylic Acid. Acidum Salicylicum (B. Ph., 1885). Salicin. A neutral principle occurring in various kinds of Willow bark.

Med. Prop., Uses, &c. Salicylic acid occurs in the flowers of Spiræa ulmaria, also as methyl-salicylic ether in the leaves of Gaultheria procumbens (*q.v.*). It has been synthetically prepared from salicin. It exists as small white acicular crystals, having a yellowish colour, and slight odour; it is irritating if much is inhaled. Salicylic acid is soluble in alcohol or ether, but very slightly in cold water. If, however, an alkali or biborate of sodium be added, the acid pretty readily dissolves. With ferric chloride a deep ruby-violet colour appears. It is liable to contain impurities, especially carbolic acid, to which some of the symptoms at first accredited to salicylic acid, were probably due.

Salicin, a neutral body, prepared from the bark of Salix and Populus. It crystallizes in colourless plates, or flat rhombic prisms. It is soluble in 30 parts of water, being more soluble in the presence of alkalies.

Salicylic acid, in combination with alkalies, forms soluble salts, of which the best known is that of sodium.

Physiological Action. The action of salicin is practically identical with that of salicylic acid. There seems every reason to believe the view advanced by Senator, that salicin becomes converted in the organism into saligenin and glucose. The saligenin when oxidized becomes transformed into salicylic acid. If this explanation be true, it elucidates the clinical observation that patients get under the influence of salicylic acid far more rapidly than under that of salicin.

In health the temperature was found by Ringer to be unaltered by the administration of salicin. Full doses produced some dizziness, frontal headache, &c., while vomiting and purging followed still larger doses. Ranke and Rabuteau found small doses produced but little effect.

Salicylic acid, in the case of certain plants, stay various processes, in virtue, it is presumed, of its anti-ferment action. On animals, small doses occasioned salivation, vomiting, and diarrhœa, while the sight and hearing were dull. Sensibility, motility, and reflex excitability were more or less abrogated by large doses, while tetanic convulsions ensued upon still more massive ones. The pulse rate is lowered, and the pulse is rendered weak and intermittent. The respirations are quickened. In health the circulation is but little affected by salicylic acid, if given in limited doses; when large quantities are taken the pressure in the vessels falls, and the heart stops. In the normal man the temperature is hardly at all affected. When, however, a pyrexial condition is present, the temperature is rapidly depressed to the

normal. In about ten minutes or a quarter of an hour after the administration of salicylic acid to a pyrexial patient, the pulse rate increases, there is flushing of the face, suffusion of the eyes, and a copious burst of perspiration heralds in a declension in the temperature. The administration of salicylates is not without drawbacks and dangers. Nausea and vomiting of an alarming nature may occur. Upon the heart it is said the salicylates act as powerful depressants, so that in cases of persons having a weak heart they may produce a most deleterious effect. Dr. Maclagan has observed that myocarditis is a very frequent complication of rheumatic fever, and one whose presence or severity is not easily ascertained. In this case the enfeebled heart muscle may well be done to death by heroic treatment with this agent. Dr. Bartholow cautions against this treatment whenever there is suspicion of a weak or greatly taxed heart. It remains, however, to be shown that salicylic acid is in the strict sense of the word a heart poison. In some cases, even when no pronounced heart weakness existed, alarming symptoms have been recorded as following the use of medicinal doses. In these instances the effects were such as to give rise to a state of collapse not inaptly designated *the salicylic acid typhoid state*. Useful remedy as salicylic acid is, there cannot be a question that it is one needing the most careful and skilful handling. Some observers have found salicin produce symptoms less obnoxious than those arising from the use of the acid. It is very remarkable that such should be the case, since salicin must be conceded to act by becoming converted into salicylic acid in the body.

The kidneys appear to take the most active part in eliminating salicylic acid, and it is believed that in many cases considerable renal irritation is caused by the passage of the salicylate through the kidneys, resulting in the production of albuminuria.

In many individuals considerable distress arises during the salicylic acid treatment. The symptoms resemble those of quinism. The head becomes the seat of intense throbbing pain, there is tinnitus aurium, ringing, singing, and buzzing in the ears. Visual hallucinations with delirium, usually wandering and restless, supervene, while absolute deafness is present. Mydriasis and ptosis with strabismus have been observed. Muscular tremblings appear, with weakening of the involuntary muscle. Maragliano, of Genoa,[1] states that the pulse increases in tension and force, a statement which is diametrically opposed to those based by Köhler upon his experiments. After dividing the vagi and the cord Köhler still found a lowered arterial pressure. We cannot here press this question to solution, but must limit ourselves to the statement that this discrepancy may be explained by accepting the view of Danewski that the rise of arterial tension is in fact the expression of a vaso-motor spasm.

Preparations and Doses:—Of the Salicylic Acid, gr. v.–xxx. From this *an ointment* is prepared; salicylic acid one part, soft paraffin eighteen parts, hard paraffin nine parts. *Of the salicylate of sodium*, gr. x.–xxx.

1962. *Therapeutic Uses. In Antiseptic Surgery*, salicylic acid is used as a dressing in the form of salicylate wool, or silk (10 per cent.). A "cream," which Mr. Watson Cheyne commends for smearing over the skin about *Wounds, Cut Surfaces*, &c., is composed of two parts of salicylic acid, one of carbolic to ten of glycerine.

1963. To correct *the Fœtor of Sweating Feet.* The following formula used in the Austrian army is most efficacious in correcting the disgusting odour arising from the feet in *Bromidrosis*. Ac. salicyl. three parts, starch ten parts, chalk seventy-five parts. The chalk may be replaced by talc, eighty-seven parts to the hundred.

[1] Centrallblatt f. Med. Wiss. 1882.

1964. One of the most efficacious *Corn-cures* owes its merit in part to salicylic acid. ℞ Acid. Salicyl. 30, Ext. Cannabis Ind. 50, Glycerin. 240. (Gazew.)

1965. *As a Parasiticide in Skin Diseases*, salicylic acid has been extolled by dermatologists. Hence it has been used in *Tinea tonsurans* by Dr. Cottle, who employed an ointment varying in strength from gr. x. to gr. xl. ad Ung. ℥j. Rabitsch extols the use of a 10 per cent. solution in *Eczema marginatum*, *Pityriasis versicolor*, and *Sycosis*.

1966. *In Diphtheria*, as a local application, salicylic acid is useful. It is employed as a spray, with borax added to aid in its solution, and any *Diphtheritic patches* which may be visible are painted over with the acid dissolved in glycerine. This treatment should be supplemented by the use of a salicylate acid gargle.

1967. *Inflammation of the Mucous Cavities* are relieved by injections of this substance. *Urethritis*, *Cystitis*, and *Vaginitis* admit of its use with advantage. *Pyelitis*, with ammoniacal urine, is said to be much benefited by this treatment.

1968. *In Acute Rheumatism*, Dr. Maclagan commenced the use of salicine in 1874. Relying upon his theory that rheumatic fever owed its origin to miasmatic causes, he was led to test the use of willow, a tree growing in miasma-infested swamps. The success of his treatment, although in no way substantiating the truth of the miasm theory, may well be said to have revolutionized the treatment of acute rheumatism. Stricker and other German physicians had used salicylic acid for some while in treating rheumatism. A full and thorough discussion of this treatment took place before the Medical Society of London in 1881, which was enriched by careful statistics and generalizations arrived at by Drs. Hilton Fagge, Broadbent, Douglas Powell, Coupland, and others. The results may be summarized under the following heads:—That the salicylates are most useful in *Acute Rheumatism*, less so in *Chronic Cases*. That while possessing a marked power of lowering the temperature, an effect which revealed itself within twelve hours of commencement of treatment, they still exert some influence upon the disease itself. That if they protected the heart at all they did so only by cutting short the disease. In other words they exert no action upon *Endocarditis*, either prophylactically or remedially. This fact was abundantly shown in cases in which *Endocardial* and *Pericardial mischief* revealed themselves, even when the patient was wholly under the influence of the salicylate treatment. It was further shown that patients in whose cases salicylate treatment failed, such failure was, in most instances, due to concurrent heart trouble, which the salicylate failed to touch. That salicin has no advantages over salicylic acid, its action being slower, and sometimes even uncertain. Dr. Ewald, from a large experience gained in La Charité, in Paris, came to the conclusion that it was matter of indifference which drug was used, whether the acid or one of its salts. Dr. Bastian met with *Alarming Delirium* which followed salicylate of soda. He does

not, however, feel inclined to accept Dr. Murchison's view that the delirium arose from concurrent *Acute Nephritis*, due to the irritation of the kidneys by the salicylates. Upon this point Dr. Theodore Acland's observations, although incomplete, are of service. In cases watched by him he ascertained that the excretion of urea was lessened when salicylic acid was taken. Instances of severe, alarming delirium also occurred in Dr. Tuckwell's practice. Dr. Broadbent would explain these cases as being the result of the sudden fall of temperature. In giving salicylates it is necessary to get the patient under the influence rapidly. Doses of gr. xxv. or ʒss. of the salicylate of soda should be given every two hours, while the temperature keeps up. As a rule the patient will burst out in a profuse sweat within a quarter of an hour after the first dose. When the temperature is approaching the normal the dose may be lessened in bulk, and exhibited at wider intervals. It need hardly be said that this prompt and active treatment requires most careful watching. It is further most necessary *to continue the salicylate for a week or more* after complete defervescence. If relapses occur, a return to the large and frequent doses should be had resort to at once. The effect of this treatment is to relieve or wholly withdraw the pain and take the patient from a condition of extreme fever and misery to one of immunity alike from pain and pyrexia. The effect of salicylates also is to lessen or wholly relieve the joint pain. It should be remembered that the exhibition of the large doses recommended above will in many cases lead to the production of toxic symptoms, delirium, or wandering, noises in the head sometimes very distressing, deafness, and severe headache; vomiting is sometimes excited by giving salicylates. According to some observers various unpleasant sequelæ follow the employment of the salts of salicylic acid, inflammations about the joints, weakness of the heart, impairment of the renal functions. Professor Erb[1] cites a case in which the employment of salicylic acid gave rise to pyrexial seizures accompanied by rigors and an erythematous rash, which somewhat resembled that of scarlatina. But when it is remembered how widely this line of treatment is now adopted, we can hardly place any great reliance on warnings which are so seldom called for in actual practice.

1969. *Acute Tonsillitis* is most efficiently controlled by salicylic acid, as was shown by Dr. Hunt, of Wolverhampton.

1970. *In the Pyrexia of Septicæmia, Pyæmia, Puerperal Fever*, &c., salicylates are very uncertain, while in *Ague* they fail even in very large doses.

1971. *In Zymotic Diseases.* Prideaux, in a carefully written paper,[1] draws attention to the power salicylic acid possesses of checking putrefaction in milk, urine, &c., when germs have free access to these fluids. He argues, and it would seem very cogently, that the *Zymotic Diseases* offer a most likely field for the employment of this acid. At present clinical observations are hardly in accord with this reasoning. Of numerous cases of *Pneumonia*

[1] Berl. Klin. Wochensch. 1884, p. 99.

Erysipelas, &c., although the temperature fell, the course of the disease appeared unchecked. Mr. Prideaux [1] found, however, that salicylic acid was very excellent for the pyrexial condition. Dr. Reiss, it is true, believes he has cut short *Typhoid Fever*, but his observations are unhappily at variance with those of others. Dr. Weiss believes that in *Typhoid Fever* occurring in children, he has seen very marked service rendered by salicylate of soda. It kept the fever down, and promoted the general well-being of the patient, although it did not seem to shorten the attack. Dr. William Squire extols this treatment in *Scarlet Fever*, and thinks that it deserves more frequent trial in *Variola*. Dr. Tomkins, while resident medical officer at the Monsall Fever Hospital, used the treatment with most satisfactory results, saving, he believes, many lives by its use. *In Relapsing Fever*, Reiss believes this treatment is useful, he, however, admits that its action must be solely as an antipyretic, since it does not destroy or even lessen the activity of the spirilla.

1972. *In Excessive Sweating.* Salicylic acid has been suggested as a means of checking the night-sweating of *Phthisis*.

1973. In the treatment of *Diabetes*, it has many advocates. Dr. Schaetski avers that he has actually seen cases cured by its means. Dr. Müller, of Kiel, also speaks well of it.

1974. *In Menière's Disease*, although deserving a trial, since good is said to have followed its employment, its efficacy seems open to at least theoretical difficulties.

1975. *In Diseases of the Stomach*, great good, according to Dr. Bartholow, follows the use of gr. v.–x. doses before a meal. It checks fermentation, and so proves serviceable in *Gastralgia*, *Catarrh*, *Dilatation of the Stomach*.

Sandal-wood Oil. See Santali Oleum.

1976. Sanguinaria Canadensis, *Willd.* Blood Root.

Med. Prop. and Action. The root is an acrid emetic with narcotic properties. It is a local irritant of considerable power, producing inflammation when kept in contact with the skin, exciting violent irritation when snuffed up the nostril, and operating like a caustic upon fungous surfaces. Taken internally, in moderate doses, it excites the stomach, increases somewhat the frequency of the pulse, and stimulates the secretions, especially that of the lungs, and as some suppose, the hepatic also. More largely taken, it occasions nausea, reduces the force of the circulation and the frequency of the pulse. Eberle considers its sedative influence on the heart and arteries to be quite as certain as that of Digitalis, if not more so, but this was rarely observable until the medicine had been regularly continued for periods varying from five to ten days. Emmenagogue properties are also assigned to it. Its activity appears to depend upon a peculiar principle, *Sanguinarine*. The seeds and leaves are said to partake of the qualities of the root. In toxic doses, clonic spasms, with death from asphyxia, occur. Dilatation of the pupils, and rapid fall of pulse, and arterial tension, associated with decreased reflex excitability are said to take place when this drug is pushed. Therapeutic doses cause vomiting, and are reputed to increase pulmonary secretion, whilethey provoke expectoration. It contains three reputed alkaloids, Puccin, Porphyroxin (Dana), and Sanguinarina.

[1] Practitioner, Sept. 1878.

The *dose* of the powdered root as an emetic is gr. x.–lx. suspended in wate As a nauseant and stimulant expectorant, the dose is gr. j.-v.; as a diaphoret and sedative, gr. j. every one or two hours. A compound powder (Rad. Sang Pulv. gr. xl., Opii Pulv. gr. xx., Potass. Sulph. ʒij. M.) is recommended b Dr. Gibb as the least irritating of all the preparations of sanguinaria. Exte nally it is used in the form of ointment (gr. lx. ad Ung. ʒj.). Sanguinarina i used as an expectorant, gr. $\frac{1}{12}$–$\frac{1}{8}$; as a nauseant, gr. $\frac{1}{6}$–$\frac{1}{4}$; as an emetic, gr. s every ten minutes.

1977. *Therapeutic Uses. In Chronic Bronchitis*, Dr. Bartholow ha seen benefit follow the use of sanguinaria. This, Dr. Lauder Brunto attributes to a stimulation of the respiratory centres. *In Acut Bronchitis* it acts as a brisk expectorant. As an emetic in *Crou* and *Diphtheria*, the use of sanguinaria is to be deprecated.

1978. *In Duodenal Catarrh* and *Atonic Dyspepsia*, according t some authorities, this drug is useful, as it possesses decided stimu lating effects upon the intestines and liver. The most recen American writers, however, discountenance its use, having littl faith in its vaunted action upon the mucous membranes of th body. As an emetic it is far inferior to other agents, *e.g.*, apomor phine, ipecacuanha, &c. Eberle,[1] however, speaks highly of repeate small doses of the tincture in protracted catarrhal affections, an Dr. Bartholow corroborates his statements. Professor Wood, o the other hand, says he has never seen it used save in the treat ment of bronchitis, and even then with doubtful benefit.

1979. As an external preparation in *Cancer, &c.*, sanguinari possesses a mild escharotic action, and hence has been employed i the treatment of *Exuberant Granulations*, &c.; also in the treat ment of *Nasal Polypi, unhealthy callous Ulcers*, &c., it has bee recommended, but it is probable that its use is very slight.

1980. Santali Oleum. Sandal-wood Oil. The oil distilled fro the wood of Santalum album, *Linn.*

Med. Prop. and Action. Stimulant. Attention has been called to it b Dr. T. B. Henderson, of Glasgow, as a remedy in *Gonorrhœa*, he having em ployed it in above 100 cases with the most satisfactory results. He prescribe ♏xxx.-xl. thrice daily, diluted with three parts of rectified spirit, and flavoure with oil of cinnamon. Berkeley Hill finds the spirit objectionable, and sub stitutes mucilage of acacia. Failing these preparations, the capsules c Hewlett's solution can be tried. He tested its powers in 19 chronic cases: i 13 there was marked benefit; in 6 it failed; in 4 of the latter, the dose, how ever small, caused nausea and disturbance of the stomach; in the remainin two it had no effect whatever, though taken in large doses. In several case it arrested the discharge by the third day, and when taken for seven day prevented any further return. Of the 13 favourable cases, cubebs and copaib had been employed previously in 7 without any advantage. Its action seem to be upon the mucous membrane. Purging and acute nephritis, as well a roseolous eruption, have been known to occur in its use, but Berkeley Hil has never seen the rash.

Dose, from ♏xv.–ʒss.

1980*. *Therapeutic Uses. In Muco-purulent discharges from th Urino-generative tract.* Sandal-wood oil is of great value i *Gonorrhœa, Gleet, Leucorrhœa*, especially when the discharge ha assumed a chronic character.

[1] Therapeutics, ii. p. 96.

1981. SANTONICA. Santonica. Worm-seed. The unexpanded flower-heads of Artemisia maritima, *Linn.*

Med. Prop. and Action. Anthelmintic. In the round and long worm (*Lumbricus teres*) they are especially useful. Their action is heating and stimulant. The dose, gr. lx. or more, finely powdered, should be given in electuary or diffused through milk, and taken on an empty stomach. In infusion or decoction the bitterness is disgusting. Cathartics should follow or accompany their use. Their vermifuge properties depend upon a volatile oil and a peculiar principle, *Santonin* (*q.v.*).

Dose, gr. x.–lx.

1982. SANTONINUM. Santonin. A crystalline neutral principle obtained from Santonica.

Med. Prop. and Action. When pure, it occurs in brilliant, colourless, rhombic, flat prisms, inodorous, of a feeble bitterish taste, scarcely soluble in cold water, sparingly in boiling water, but abundantly in chloroform, boiling rectified spirit, volatile and fixed oils. The crystals become yellow on exposure to light. On account of the difficulty of procuring it pure, M. Gaffard suggests its use in an impure state, designated Brown Santonin, which is almost equally efficacious and much cheaper than the pure article. It was first obtained by Köhler, of Dusseldorf, in 1830, but was not known in England as a vermifuge till 1844. Four years subsequently, Sir Spencer Wells published a paper on its use, and since that time it has enjoyed a high reputation. Unless given in large doses, santonin induces no marked physiological effects; but one which occasionally attends its use is very remarkable—viz., a yellow discoloration of the vision—xanthopsia. In fatal cases hyperæmia of the nerve centres has been recorded, however, the reports are far from corroborative. Where very large doses are taken, the yellow discoloration deepens to a red hue, or even blue. The urine also assumes a peculiar yellow or reddish colour. Ill effects have occasionally, though rarely, resulted from its use.

Dose:—Gr. ij.–vj. for children under four years; above twelve years, gr. vj.–viij., with an equal quantity of white sugar or in syrup. A lozenge (Santonin gr. j. in each) has been made officinal in the B. Ph. 1885.

1983. *Therapeutic Uses. In cases of Ascarides Lumbricoïdes*, santonin is invaluable. My own experience with it, which has been very extensive, has been most satisfactory. Kuchenmeister[1] states that the worm perishes more rapidly and certainly in an oleaginous solution of santonin than in any other vehicle; hence he directs it to be given in castor oil before breakfast; this may be repeated for several mornings. Dr. Brisbane[2] employed this formula with the best effects, but Dr. Chipperfield[3] did not find it, when thus exhibited, more effectual than when given rubbed up with about thrice its weight of sugar. In many cases no aperient is needed, one or two stools succeeding its exhibition containing the worms, if any were present; still it is the safer plan to administer an aperient a few hours after the last dose of santonin. Dr. Chipperfield judiciously advises an interval of six or eight hours between any two doses of the medicine, and not to administer more than three doses in succession, allowing a space of three or four days to elapse before employing the medicine again. In cases of *Ascarides*

[1] Archiv. Gén. de Med. 4th Series, xxix. p. 206.
[2] Med. Times, June 9, 1869, p. 589.
[3] Madras Quart. Med. Journ. Jan. 1864, p. 78.

Vermiculares (Thread Worm) its effects are often very striking, though it does not exercise a curative power without the aid of constitutional treatment of salts of iron, &c. It is well to give the santonin either in an enema or as a suppository.

1984. *In Convulsions* and *Epileptiform Seizures*, when due to worms, santonin should be tried. It frequently clears up a diagnosis in such cases by expelling the parasite, thus cases regarded as *Chorea*, *Epilepsy*, &c., are found to be solely the result of reflex irritation.

1985. *In Diseases of the Eye*, the peculiar effect which santonin exerts on the coloration of vision led M. Martini [1] to employ it in *Amaurosis*, and the results obtained were so satisfactory that M. Guépin [2] was induced to extend its use to other eye diseases; and he concludes that santonin, given to the extent of gr. xxx. divided into ten doses, taken in a period of five days, produces good effects in the latter stages of *Iritis*, *Irido-Choroiditis*, and *Choroiditis* with plastic exudation, when the inflammatory condition no longer persists. In other diseases of the eye the results were either negative, trifling, or mischievous. It may often be advantageously combined with atropine and other medicines, as may be required. Drs. Brown and Ogston commend its use in inflammatory and atrophic conditions of the retina and optic nerve.

1986. *In Incontinence of Urine*, Dr. Ringer finds overdosing with santonin produces incontinence of urine in young children, but he adds, its use will counteract this very habit in some cases, even when belladonna fails. Santonin should be given in castor oil or syrup.

1987. Sapo Durus. Hard Soap. A combination of olive oil and soda. Composed of oleate and margarate of soda.

Sapo Mollis. Soft Soap. A combination of olive oil and potash. Composed of oleate and margarate of potash.

Med. Prop. and Action. Soap, in its operation, is very similar to the alkalies generally, but milder. It is rarely administered singly, as an internal remedy, as the liberation of the fatty acids entering into its composition renders it objectionable, but it is often advantageously combined with aloes and other purgatives, the operation of which it renders more speedy and mild. The Linimentum Saponis has long been held in popular esteem under the name of Opodeldoc.

1988. *Therapeutic Uses. In Poisoning by the strong Mineral Acids*, soap is an efficacious antidote. A teacupful of a strong solution should be drunk at short intervals. *Burns with the strong Acids, or with Phosphorus*, should be bathed with a solution of soap.

1989. *Dyspepsia attended with Acidity of the Stomach* is often benefited by the internal use of soap, in combination with rhubarb and an essential oil. *In Pyrosis*, Dr. Mason Good thought highly of the value of soap, either alone or with opium. *Habitual Con-*

[1] Comptes Rendus, March 1860.

[2] Op. cit. and Med. Times and Gaz. Sept. 1, 1866, p. 219.

stipation, when the fæces have become hardened and impacted, is often relieved if not altogether removed, by an enema of a strong solution of soap.

1990. *To Abscesses*, to hasten the suppurative process, a popular sailor's application is a plaster, composed of equal parts of common yellow soap and brown sugar, beaten together in a paste, spread on a bit of linen, and placed over the part. I have used it myself, and seen others use it in a great number of cases; it greatly eases the pain, and appears to hasten the suppurative process more than any other application. Its simplicity is a great recommendation to its use.

1991. *In Sprains, Bruises, Chronic Rheumatism*, &c., Soap Liniment diligently rubbed in for fifteen or twenty minutes, two or three times a day, affords great relief. A portion of laudanum (f℥j. to f℥j.) may be advantageously added.

1991*. Sarsæ Radix. Jamaica Sarsaparilla. The dried root of Smilax officinalis, *Kunth*.

Med. Prop. and Action. Alterative and tonic, reputed diaphoretic. Much discussion has arisen concerning its physiological action, and the matter can hardly be considered settled even at present. Its active principles are an alkaloid, Parilline (Smilacine), and an essential oil. Palotte observed that *Smilacin* produces, in small doses, nausea and diaphoresis, and in larger ones it exercises a sedative action on the heart and arterial system. In common with other alterative tonics its effects are not very obvious, and its *modus operandi* is as yet obscure.

Dose:—Of the Powdered Root, gr. xxx.-lx. *Of the Liquid Extract*, f℥ij.-iv. *Of the Decoction*, f℥ij.-x. *Of the Compound Decoction*, f℥ij.-x, three or four times daily.

1992. *Therapeutic Uses. In Syphilis*, sarsaparilla was formerly esteemed a specific; but the trials of Mr. Pearson have proved the fallacy of the opinion. It is supposed to act chiefly by inducing a healthy tone of the biliary and digestive organs. It may be given to the extent of Oj. of the decoction, or more, daily, and may be advantageously combined with nitric acid (Acid. Nit. Dil. ℥x. ad Decoct. Sarsæ Co. f℥j.) or with the iodide of potassium. *In Syphilitic Sore Throat, with Phagedæna*, the combination with the acid proves the most useful. Opium may, at the same time, be given in liberal doses.

1993. *In Chronic Affections of the Liver*, sarsaparilla is highly spoken of, it is chiefly serviceable where the languor of the secreting vessels has become permanent.

1994. *In Chronic Rheumatism consequent on Syphilis, or attended with much debility*, the compound decoction proves highly serviceable. It may be combined with nitric acid, the iodide of potassium, or opiates. How far the benefit is due to the sarsaparilla is doubtful.

1995. *In Chronic Coughs* occurring in debilitated constitutions, attended with redness and relaxation of the mucous membrane of the fauces, and elongation of the uvula, Prof. Graves speaks highly

of the following formula:—℞ Decoct. Sarsæ Oj., Acid. Nit. dil. f℥j. A third part is to be taken thrice daily.

1996. *In Chronic Diseases of the Skin*, the compound decoction or liquid extract may be given with evident advantage, particularly when they are of syphilitic origin, or when the digestive organs are evidently deranged. Local applications at the same time should not be neglected.

1997. Sassafras Radix. Sassafras Root. The dried root of Sassafras officinale, *Nees*.

Med. Prop. and Action. Alterative-tonic and diaphoretic. Its activity depends on a volatile oil, which is dissipated by boiling; it is, consequently, best given in infusion. The volatile oil (♏ij.–v.) is the best form for internal use. It is rarely used alone, but chiefly in combination with sarsaparilla or guaiacum. It is inadmissible in all sthenic inflammatory states. It contains about nine per cent. of a peculiar principle, *Sassafrin*, and five per cent. of tannin.

1998. *Therapeutic Uses. In Constitutional Syphilis, Scurvy, and in Cutaneous Affections*, it has been employed; but its utility is very doubtful.

1999. *In Chronic Rheumatism* it has long been held in repute. When the circulation is languid, the skin dry, and the kidneys, liver and bowels inactive, the greatest benefit frequently results from its use either alone or with other appropriate remedies.

2000. Scammonium. Scammony. A gum-resin obtained by incision from the living root of Convolvulus scammonia, *Linn.*

Scammoniæ Resina. Resin of Scammony.

Med. Prop. and Action. Drastic purgative, particularly adapted for persons of a phlegmatic temperament, and for cases of constipation depending upon torpor of the colon. M. Rayer, with the view of testing the value of scammony, administered it in 210 cases, and the following are the results of his observations:—(1) The scammony of Aleppo, in doses of gr. xviij., usually occasions three or four motions; if administered in gr. xxvij. doses, its action is seldom equal to, and sometimes weaker than, that resulting from the smaller dose of the medicine. (2) The addition of acids or alkaline fluids to scammony does not increase or diminish its power in any evident manner. (3) The resin of scammony, in doses of gr. ix., produces a purgative action equal to that occasioned by gr. xviij. of common scammony. (4) The resin is to be preferred, as it acts with certainty and uniformity, and the scammony of commerce is always more or less impure. Scammony occasionally causes severe griping; but this may in a great measure be obviated by reducing it to a very fine powder, and giving it in conjunction with the sulphate of potash. The operation of scammony is chiefly irritant, and affects the whole of the bowels; on this account, it acts most effectually when there is a deficiency of intestinal mucus, indicated by hard dry fæcal evacuations, in which case, however, it is very liable to gripe, an effect which may be diminished by the means described above. When there is copious mucous secretion, it has less efficacy, and is, therefore, not so well adapted as a purgative to remove intestinal worms as gamboge or colocynth. It is stated by Dr. Christison never to become poisonous in an over-dose. The compound powder is a good form for internal use, and is particularly adapted for children.

Dose:—Of pure Scammony, gr. v.–x. *Of the Resin*, gr. iij.–viij. *Of the*

Mixture, ʒj.–iij. for adults. *Of the Confection*, gr. x.–xxx. *Of the Compound Powder*, gr. x.–xx. for adults; gr. vj.–viij. for children, gr. iij.–v. for infants. In the B. Ph. 1885, Resin of Scammony replaces Scammony in the Confection and Compound Powder.

2001. *Therapeutic Uses. In Dropsy and Dropsical Affections*, scammony is sometimes advantageously exhibited as a hydragogue cathartic, and may be given in combination with the acid tartrate or acetate of potash. It is, however, inferior in efficacy to elaterium, croton oil, or gamboge.

2002. *In Cerebral Affections*, it proves useful not only as a purgative, but as a revulsive and derivative. Dr. A. T. Thomson considers that it is well adapted in maniacal cases for removing the scybala which often accumulate and remain for a long time in the coils of the colon.

2003. *Against Lumbrici and Ascarides Vermiculares*, the compound powder, in combination with calomel, acts with certainty and rapidity. It may be safely given to children in doses of gr. viij.–x., and to infants in doses of gr. iij.–v.

2004. Scilla. Squill. The bulb of Urginea scilla, *Steinh.*

Med. Prop. and Action. Stimulant, expectorant and diuretic in doses of gr. j., gradually increased until slight nausea is produced. In larger doses it is powerfully emetic and purgative. Its diuretic effect is seldom observable if purging or emesis be produced, and, consequently, when the first of these effects is desired, the medicine should be given in small doses, and discontinued on the occurrence of nausea. When it fails to occasion diuresis, which it occasionally does, it increases the cutaneous secretion. Its diuretic operation is rendered more certain by combination with other remedies of the same class. As an expectorant, it is said to attenuate the mucus, and also to excite a more copious excretion of it from the lungs, thereby lessening the congestion upon which the difficulty of respiration depends. As an emetic, it is objectionable on account of the uncertainty of its action; large doses, in some instances, having a very slight effect, whilst, in others, a small dose acts with extreme violence. In excessive doses, its operation is that of an acro-narcotic poison, gr. xxiv. having proved fatal. When recent, the bulbs are very acrid, and, applied to the skin in this state, cause inflammation and vesication; but, by long keeping, this property is either greatly diminished or altogether dissipated. Their activity depends upon two principles: (1) an acrid resin; (2) a bitter principle, *Scillitine* or *Scillitite*. Squill spoils by exposure to the air, and consequently requires to be kept in closely stoppered bottles.

Dose:—Of Powdered Squill, gr. j–iij., as an expectorant and diuretic; gr. x.–xv. as an emetic. *Of the Tincture*, ♏x.–xxx. *Of the Vinegar*, ♏xv.–xl. *Of Oxymel*, fʒss.–j. *Of the Syrup*, fʒss.–j. *Of the Compound Pill*, gr. v.–x.

2005. *Therapeutic Uses. In Asthma*, benefit is often derived from squill, in combination with hemlock or henbane. The following formula has been found highly serviceable:—℞ Ext. Hyoscyam. gr. iij., T. Scillæ gutt. xv., Acid. Nit. dil. ♏xxx., Aq. ʒjss. M.

2006. *In Chronic Bronchitis, Coughs, and Catarrh*, squill proves highly useful, by promoting a more copious secretion from the mucous follicles, unloading the air-passages, and relieving the congestion and dyspnœa. It should never be employed until all active inflammation has subsided.

2007. *In Dropsy, Anasarca,* &c., squill given singly appears to exercise inconsiderable influence, but in combination with other remedies it proves of the greatest service. The following is Dr. Baillie's formula :—℞ Pulv. Scillæ gr. j., Pil. Hydrarg. gr. iij., Pulv. Digitalis gr. j.–jss. It may also be advantageously combined with the acetate or tartrate of potash. It is inadmissible in dropsy connected with granular disease of the kidney, or whilst any acute inflammatory action is present. It is principally indicated in asthenic cases.

2008. *In Dysuria,* a combination of Acetum Scillæ and Sp. Æther. Nit., in equal parts, is often productive of the best effects. Of the mixture, ℥xxx. in aniseed water, ℥ij., may be repeated every hour or oftener.

2009. Scoparii Cacumina. Broom Tops. The tops of the common Broom, Sarothamnus scoparius, *Koch.*

Med. Prop. and Action. Diuretic in small doses. Their activity apparently resides in a neutral principle, *Scoparine,* but it may be partly due to a viscid oil *Sparteia,* and to the salts, of which the tops contain a large proportion. The researches of Dr. Fick show that while Scoparin is diuretic, Sparteia acts upon the nervous system, producing in large doses very definite toxic effects. The intellectual faculties become clouded, the reflexes of the cord are lessened, while paralysis of the motor nerves takes place. The vagus is completely paralysed. Death when it occurs is due to paralysis of the centres of respiration. Scoparin in large doses causes purging and vomiting ; scoparine is a hydragogue diuretic of great power.

Dose:—Of the Dried Tops, gr. xx.–xxx. in infusion. *Of the Juice,* f℥j.–ij. *Of the Decoction,* f℥ij.–iv.

2010. *Therapeutic Uses in all forms of Dropsy.* From the days of Sydenham, Broom has been extolled for its diuretic effects. Dr. Wood regards it as one of the most reliable diuretics.

Seidlitz Powders. See Soda Tartarata.

2011. Senegæ Radix. Senega Root. The dried root of Polygala senega, *Linn.*

Med. Prop. and Action. Stimulant, expectorant, diuretic, and emmenagogue, in doses of gr. x.–xl., every three or four hours; in larger doses it proves emetic and cathartic. It is a powerful stimulant of the absorbent system; it increases all the secretions, particularly the urine and saliva; indeed, in some instances, a copious and troublesome salivation occurs during its prolonged use. It diminishes irregularity of the heart's action, renders the pulse slower and firmer, and imparts a tone to the digestive organs, and to the general system. Its activity depends upon *Senegin* or *Polygalic Acid,* which, in doses of gr. viij., has proved fatal to dogs in three hours. It is contra-indicated in all active inflammatory states, particularly of the lungs.

Dose:—Of the Infusion, f℥j.–ij. *Of the Tincture,* f℥ss.–ij.

2012. *Therapeutic Uses. In Pneumonia,* when the inflammatory symptoms have subsided, and any amount of debility, with weak pulse, cool skin, cough, and dyspnœa remains, Dr. C. J. B. Williams recommends the use of the decoction of senega. *In Chronic Catarrh,* it has also been found highly serviceable; and in *Chronic Bronchitis,* Dr. Stokes preferred it to all other remedies, particularly when given

in combination with carbonate of ammonia. This combination proves also highly useful in all *Lung complications of Typhoid and Typhus Fevers.* The tincture is a valuable adjunct to expectorant mixtures.

2013. *Diphtheria.* In the second or advanced stage, stimulant expectorants are often required, and when repeated emetics are indicated in the decline of the disease, a stimulant, *e.g.*, ammonia, should be combined. Senega is here of the greatest value, either in large repeated doses as an emetic, or with ammonia, squill, &c., as an expectorant. Dr. West furnishes an excellent formula:—℞ Decoct. Senegæ ℥ijss., Ammon. Carb. gr. viij., T. Scillæ ♏xvj., Syr. Tolu ʒiij. M. Dose, ʒiij. every four hours for a child æt. two to three years. Sweetened with treacle or coarse sugar, and given with about a third of milk, children will seldom refuse it.

2014. *In Gastro-enteritis complicated with Disease of the Lungs,* senega is highly spoken of by Dr. Stokes. He states that, if given before ptyalism is produced, its virtues are small; but that after this has been effected, it will seldom disappoint the practitioner. He advises the following formula:—℞ Decoct. Senegæ f℥vij., T. Scillæ, T. Opii Camph. āā fʒj., Ammon. Carb. gr. v.–xx. M. ℥ss. to be taken every second hour.

2015. *In Ascites and Dropsical Affections occurring after Fevers and other Debilitating Diseases,* the influence of senega is often very marked.

2016. *In Valvular Diseases of the Heart,* senega is a reputed diuretic, and hence it has been recommended in the water-logged condition which is liable to ensue upon mitral disease. It has also been recommended to allay the painful circulatory excitement which gives such distress in aortic and aneurismal disease.

2017. *In Amenorrhœa, Dysmenorrhœa,* and *Membranous Dysmenorrhœa,* senega is reputed to act powerfully and certainly as an emmenagogue.

2018. Senna. Sennæ Folia. Senna Leaves.

Med. Prop. and Action. Valuable cathartic, holding a mid place between mild laxatives and drastic purgatives. It acts chiefly on the small intestines, increasing their mucous secretion, as well as their peristaltic motion, and producing loose brown evacuations. It does not depress the circulation or cool the system like many other cathartics, but it has rather a general stimulating effect, which, however, is by no means so well marked as to forbid its use in any circumstances of general excitement or reaction. (Christison.) Its use is attended by little, if any, subsequent constipation. Its activity was formerly thought to be due to cathartine. This body has been shown to be complex. Draggerdorff and Kubly discovered an active principle, which they called cathartic acid, but Bourgeois and Bouchut have demonstrated that there is a further active purgative principle besides cathartic acid. This has not been isolated. Senna generally operates under four hours, and in some persons its operation is attended with griping; this may be in a great measure obviated by combining it with carminatives. *Its efficacy is increased* by drinking plentifully of diluents, by the addition of pure bitters, of camphor, or of the decoction of guaiacum; also by the sulphates of magnesia and soda, and some other saline purgatives. *Its efficacy is decreased or destroyed* by boiling, by being kept long ready-made, by the carbonates of alkalies, and by rhubarb. *Its*

nauseous taste is disguised by giving it in strong coffee, or by the addition of milk and sugar, when it much resembles common tea. That it exercises a specific action on the bowels is shown by the experiments of Petit, who found fomentations of senna leaves placed over the abdomen produce a brisk cathartic operation. If given to a woman during lactation, it communicates a purgative property to the milk.

Dose:—Of Senna Leaves, gr. xx.–cxx. *Of the Infusion*, ʒj.–iij. *Of the Compound Mixture*, ʒj.–jss. *Of the Tincture*, ʒj.–iv. *Of the Syrup*, ʒj.–iv. *Of the Confection*, "*Lenitive Electuary*," ʒj.–ij.

2019. *Therapeutic Uses. In Habitual Constipation, in the Constipation of Pregnancy, and in the Puerperal State*, senna, particularly in the form of the confection (the old Lenitive Electuary), proves a mild and efficient purgative. It is of an agreeable flavour, leaves no subsequent constipation, and causes very slight excitement. It is a very eligible laxative in all *Hæmorrhoidal Affections.*

2020. *In Bilious Derangements and Visceral Obstructions*, the infusion of senna, in doses of ʒj.–iij., either alone or combined with sulphate of magnesia (gr. cxx.–ccclx.) or tartrate of potash (gr. lx.–cxx.), forms an efficient purgative. It is best given in the morning, a mild mercurial being taken the previous night. *In Atonic Dyspepsia* also, particularly when attended by constipation, a mixture of equal parts of the infusions of senna and gentian proves eminently serviceable.

2021. Sinapis. Mustard. The seeds of Sinapis alba, *Linn.*, and Sinapis nigra, *Linn.*

Med. Prop. and Action. Mustard, in small doses, is stimulant; it improves the tone of the digestive organs, promotes the digestibility of many articles of food, and increases the appetite. Under its continued use, the secretion of urine becomes greatly augmented. In doses of from one to three teaspoonfuls it is emetic, effectually clearing out the stomach, without producing any great amount of subsequent depression. Externally applied in the form of poultice, it is irritant, and if left in contact with the skin for a long period, causes vesication. The activity of Black Mustard depends upon an acid (Myronic Acid) which is combined with potash and an albuminoid body called emulsin. Alcohol, vinegar, and too hot water interfere with the production of the volatile oil, and therefore should not be used in the preparation of mustard poultices. This oil (Ol. Sinapis, B. Ph.) has an intensely penetrating odour, and very acrid burning taste, and applied to the skin, produces almost instant vesication. White Mustard contains a crystallizable compound, *Sulphosinapisin*, which gives rise to an acrid principle. Both kinds contain from 25 to 35 per cent. of a fixed oil. Flour of Mustard, as usually met with, is composed of two parts of black and three of the white seed, with a portion of wheat flour and turmeric. It is an effectual and ready emetic in narcotic poisoning.

2022. *Therapeutic Uses. In Inebriety*, &c., and all cases when it is desirable to produce full emesis, with little expense to the strength, the flour of mustard, in doses of a tablespoonful or less in a tumblerful of warm water, is a speedy and efficacious remedy.

2023. *In Amenorrhœa*, Dr. Ashwell states that he has often seen the mustard hip-bath useful, the patient remaining it it for an hour each time. *In Dysmenorrhœa*, the mustard hip-bath is well spoken of by Dr. Ashwell. It should be repeated three or four

times a day, the patient remaining in it from thirty to sixty minutes, or even, if the pain be very severe, until faintness is induced. *In Uterine Discharges arising from Ulcerated Carcinoma*, Dr. Ashwell found much benefit from the following vaginal injection :—℞ Pulv. Sinapis ʒij., Aq. Ferv. ℥xvj. M. This should be employed once a day, or two or three times a week, and should be of a strength to excite only a little tingling. It is particularly useful when the discharge is thin and ichorous.

2024. *In Insanity*, Dr. S. Newington has derived great benefit from mustard baths (five or six handfuls of crude mustard to an ordinary warm bath), mustard fomentations, and large sinapisms. In cases where there is determination of blood to the head, with sleeplessness, restlessness, and anxiety, he directs the whole of the legs and the lower part of the abdomen to be enveloped in cloths steeped in mustard and hot water, a wet towel being at the same time applied round the head.

2025. *Sinapisms, or Mustard Poultices*, are excellent counter-irritants, producing a certain and rapid effect. They are usually made with flour of mustard, mixed to the consistence of a poultice with cold water or vinegar. As hot water fails to dissolve out the active principles present in mustard, poultices, &c., must be prepared from a cold infusion. In the same way, pediluvia and hip-baths should be prepared by steeping the mustard in cold water, and when all the mustard is well soaked boiling water may be added. The blisters raised by mustard heal reluctantly, and painful ill-conditioned sores are apt to follow its use. As a vesicant it is greatly inferior to cantharides. Dr. Paris advises its mixture with the oil of turpentine; but if it be desired simply to increase the stimulating effect of the poultice, the surest way is to add a small portion of bruised capsicum. In persons of delicate skins, as in women and children, it is advisable to place a piece of muslin between the poultice and the skin. If a sinapism is allowed to remain in contact with the skin above twenty or thirty minutes, it may cause vesication. It should be removed when it causes great pain.

2026. In all *Inflammations of Serous and Mucous Membranes*, where the inflammatory action is not severe, or where the patient will not bear more active treatment, sinapisms, or poultices of linseed-meal, or bread containing mustard, are valuable counter-irritant applications. In the treatment of inflammatory attacks in children, they often prove of the greatest service.

2027. *In Apoplexy, Delirium, Coma, Paralysis, Congestive Headaches, and in Cerebral Affections occurring in the course of Fevers*, sinapisms, to which have been added powdered capsicum or oil of turpentine, may in most instances be applied with evident advantage to the soles of the feet and the inner parts of the calves and thighs. Their action is that of a speedy and powerful derivative.

2028. *In Cholera, Colic, Colica Pictonum, Ileus, and in Spasmodic Affections of the Bowels unattended by Inflammation*, a sinapism over the whole surface of the abdomen affords, in most

cases, a great amount of relief. *Gastrodynia* is also often much benefited by its application.

2029. *In Continued and other Fevers, when they assume a Typhoid character*, and particularly when complicated with head affections, the application of sinapisms to the extremities, acting as a revulsive and stimulant, often proves of service, sometimes restoring the vital powers in a remarkable manner.

2030. *In Gout*, the application of a sinapism to the inflamed part sometimes affords speedy relief. Prof. Graves mentions three cases in which it proved successful. *In Retrocedent Gout*, a sinapism placed over the originally affected part, or to the extremities, is occasionally effectual in causing the disease to reappear in its former, or in a less dangerous locality.

2031. *In Coughs attended with much Dyspnœa*, a sinapism to the chest often affords relief. *Hooping-cough* is often benefited by sinapisms to the spine. *In the Bronchitis of Typhus Fever*, an emetic of mustard, observes Dr. Murchison, is said to act sometimes like a charm, by promoting copious expectoration, and allowing free ingress of air into the bronchial tubes, so as to save the patient from impending suffocation. *In the Pneumonia and Broncho-pneumonia* of children, where there is severe pain, sinapisms are favourably spoken of by Dr. Hillier. He condemns the use of blisters in these cases.

2032. *In Uterine Affections*, a severe, sharp, acute pain is best met by the application of a strong mustard poultice over the hypogastric region, or round the loins; to be repeated at intervals.

2033. Sodium. Metallic Sodium. A bright soft metal introduced into the B. Ph. 1885.

Med. Prop. and Action. The metal is employed in the preparation of Liquor Sodii Ethylatis (*v.* Sodii Ethylatis, Liq.)

2034. Sodium Salts.

Med. Prop. and Action. The action of the salts of sodium varies within wide limits; the individual peculiarities of the salts are considered under their respective headings, but over and above these there are certain peculiarities belonging to the group generally that demand a special notice. Some of the salts are alkaline, and hence act as antacids, and check alkaline secretions, while they promote those of an acid reaction. (Ringer.) To increase the supply of gastric juice, the alkali should be given shortly before a meal. The salts of sodium are by Dr. Garrod held to act more upon the liver, while corresponding salts of potassium influence more the renal secretion. The researches of Ringer upon the action of potassium and sodium seem to show that the last-named metal is practically harmless when administered in any of its salts, while potassium is a powerful heart depressant and protoplasm poison. Hence it would appear desirable to employ sodium rather than potassium salts, unless a depressant action is wished for. The salts of sodium are used both externally as caustics, *e.g.*, Soda Caustica, Liq. Sodii Ethylatis, and internally as antacids, tonics, and alteratives. The following salts have been added to the B. Ph. 1885:—Sodii Bromidum, Sodii Iodidum, Sodii Salicylas, Sodii Sulphis, Sodii Sulphocarbolas, while the Sodæ Acetas has been omitted.

2035. *Therapeutic Uses.* See under the various Salts.

2036. Soda Caustica. Caustic Soda. Hydrate of Soda.

Med. Prop. and Action. Caustic and escharotic. It is used in the same manner, and is applicable to the same cases as caustic potash. It is, however, less deliquescent, and therefore more manageable. Liquor sodæ possesses similar medicinal properties to liquor potassæ. It is antacid, and acts as a direct sedative to the stomach. *Dose of Liquor Sodæ*, x.-xxx. freely diluted.

2037. Soda Tartarata. Tartarated Soda. Also called Sodæ et Potassæ Tartras; Sodæ Potassio-tartras; Tartrate of Potassium and Sodium; Rochelle Salt.

Med. Prop. and Action. A mild, cooling purgative in large doses, in small it renders the urine alkaline, and acts as a cooling febrifuge. It occurs in colourless transparent prisms, tastes like common salt, and is devoid of odour. According to Dr. Rutherford it possesses a feeble action upon the liver, but a powerful one upon the intestines.

Dose, ʒij.–iv. well diluted.

2038. *Therapeutic Uses. In Febrile states*, especially when accompanied with *Constipation*, and *Scanty Urine loaded with Lithates*, Rochelle salts are useful. As a purgative it is less active than Epsom salts (see Magnes. Sulph.) but is far more palatable, and is also milder in its action. As it possesses a decided effect upon the urine, rendering it alkaline, its use is indicated in cases of *Scalding Acid Urine*, such as is associated with the gouty diathesis, high living, with little exercise, &c. The action of this, as of other saline purgatives, is greatly enhanced by free dilution.

2039. Sodæ Biboras. Borax. Biborate of Soda. Pyroborate of Sodium.

Med. Prop. and Action. Refrigerant, diuretic, and emmenagogue. It has also been employed as a solvent for calculi. Dr. Binswanger, who has examined the properties of this salt, draws the following conclusions:—1. Its action is very similar to that of the carbonate of soda; like it, it has an alkaline reaction, it acts as an antacid, and, when in solution, it absorbs carbonic acid, and dissolves fibrin, albumen, casein, and uric acid. Swallowed in large doses, it occasions oppression of the stomach, nausea, and vomiting. It becomes absorbed into the system, and is afterwards eliminated by the kidneys and other secreting organs. It was detected in the blood of the portal vein, in the bile, and in the saliva, and has, therefore, probably, an influence on the process of chymification. If taken in large and repeated doses it produces the same injurious effects as the other alkalies—deranged digestion, a scorbutic condition of the body, and sometimes an impetiginous eruption. 2. It has no specific power of exciting uterine contractions, of promoting menstruation, or of curing aphthous ulceration; though, like the carbonated alkalies, it may, by relaxing muscular fibre, slightly relieve spasm of the uterus; or, by its liquefacient properties, promote evacuation of the menstrual fluid; or, by its mild alkaline qualities, improve the condition of the skin and mucous surfaces. Its power as a solvent of calculus is very great. Externally applied, it is a mild and efficient detergent.

Dose:—Of Borax, gr. v.–xl. *Prep. for external application:—Mel Boracis* gr. lx., *Mel* ʒj.; *Glycerinum Boracis.*

2040. *Therapeutic Uses. In Aphthæ and Aphthous Ulceration of the Mouth,* the mel boracis is a popular and efficient application. Sir T. Watson advised equal parts of this linctus, incorporated with syrup of poppies, as a good form; antacids being given internally at the same time. *In the Aphthous Ulceration which attends the advanced stages of Phthisis,* he states that he has employed it with advantage. *In Cracked Tongue,* Dr. Brinton found the following formula peculiarly serviceable:—℞ Sodæ Bibor. gr. xl., Glycerini f℥j., Aq. ℥iv. For *Hoarseness, Clergyman's Sore Throat,* a gargle made with borax is very effectual. Dr. Ringer recommends sucking a small fragment of borax in *Aphonia from over use of the Voice.*

2041. *In Uterine Affections,* borax has been well spoken of. Dr. Rigby observes that it seems to possess a peculiar power in exciting the activity of the uterus, and that he has employed the following formula in *tedious Labours, where there is deficiency of Uterine contractions,* with the best effect:—℞ Ergotæ gr. xx.–xl., Sodæ Bibor. gr. x., Aq. Cinnam. ℥ijss. *In Chlorosis,* Dr. Copland advises the following formula:—℞ Sodæ Biboratis gr. xl., Sulphur. Præcip. ʒj., Mucilag. Acac. q.s. To make twenty-four pills, of which three should be taken in the day. *In Amenorrhœa,* he prefers the subjoined pills:—℞ Sodæ Bibor. ʒss., Aloes Socot., Pulv. Capsici āā gr. xx., Ol. Lavand. q.s. To make eighteen pills. *In Leucorrhœa,* when the discharge is acrid, giving rise to irritation externally, frequent ablutions are requisite, and the parts should be kept moist with a lotion of the biborate or carbonate of soda. (Dr. Graily Hewitt.) *In Dysmenorrhœa,* it has also been given with advantage, combined with ext. belladonnæ, as also in *Puerperal Diarrhœa,* if the lochia be suppressed.

2042. *In Pruritus Pudendi Muliebris,* great and speedy relief often attends the application of a strong solution of borax. The following, advised by Dr. West, is a good form:—℞ Sodæ Bibor. ʒiv., Morphinæ Hydrochlor. gr. viij., Aq. Lauroceras. ℥j., Aq. Rosæ ad ℥x. M. *In Pruritus Scroti et Ani,* it also affords great relief.

2043. *In Chronic Cystitis,* Sir H. Thompson speaks highly of the following soothing injection:—℞ Sodæ Bibor. ℥j., Glycerini ℥ij. M. Of this two or three teaspoonfuls are to be added to ℥iv of warm water.

2044. *In Gonorrhœa,* an aqueous solution of borax (gr. x.–xv. ad Aq. ℥iij.) has occasionally been used as an injection with benefit.

2045. *In Acne Simplex,* Dr. Copland states that the lotion from which he has derived the greatest benefit is a solution of borax in rose or elder-flower water, or in water which has been poured in the boiling state over sulphur, and allowed to infuse for ten or twelve hours. He advises the same lotion in *Ecthyma. In Ringworm of the Scalp,* Prof. Christison used, with the best effects, a solution of borax (ʒj.) in distilled vinegar (℥ij.).

2046. *To Sore or Fissured Nipples,* a saturated solution of borax, or the following, advised by Sir Astley Cooper, is often beneficial:—

℞ Sodæ Bibor. ʒj., Sp. Vin. Rect. fʒss., Aq. ad ʒiv. M. It should be applied to the nipple before and after suckling the infant.

2047. *To Chloasma or Liver-spots*, Dr. Pereira states that a solution of borax (ʒss. ad Aq. ʒviij.) is a most valuable application; it should be applied by a sponge or rag to the affected spots. I have found a similar lotion very effectual in allaying the itching in *Urticaria, Psoriasis, Impetigo, &c.*

2048. *In Mercurial Salivation*, an aqueous solution, with or without honey, forms a useful gargle. A similar gargle is of use in *Diphtheria.*

2049. Sodæ Chlorinatæ, Liquor. Solution of Chlorinated Soda. Labarraque's Disinfecting Solution of Soda.

Med. Prop. and Action. Stimulant, tonic, and antiseptic. Externally, it is a stimulant, astringent, and deodorizer; it is best applied in the form of lotion (ʒj. ad Aq. ʒx.–xv.). As a deodorizer it is of great value, and is eminently useful in correcting and destroying the unpleasant smells so common in sick rooms; it is also represented as a disinfectant, but it is far from satisfactorily proved that it possesses the alleged property of arresting the progress of any infectious disease. *It is an antidote in poisoning by Sulphuric Acid, Sulphide of Ammonia, the Sulphide of Potassium, and Hydrocyanic Acid.* A solution should, if possible, be administered by mouth, and a sponge soaked in the solution should be held to the nostrils. Locally, it may be applied in the form of poultice, prepared by adding fʒij. of the solution to an ordinary linseed-meal or other poultice.

Dose, ♏x–xx.

2050. *Therapeutic Uses. In Aphthous Ulceration of the Mouth in Children*, when it assumes a sloughing character, the following is an excellent application:—℞ Liq. Sodæ Chlor., T. Myrrhæ āā fʒss., Aq. Rosæ ʒj., Aq. ʒvj. M. *In Mercurial Salivation, in the Ulcerated Gums of Scurvy, in fetid discharges from Carious Teeth, in the Sore Throat of Scarlatina, and in all affections of the Mouth attended with a fetid discharge*, and requiring a mild stimulant application, the diluted solution (fʒvj. ad Aq. ʒxij.) proves highly serviceable, not only correcting the fœtor, but establishing a healthy action. Dr. Budd extolled its use in *Diphtheria.* The throat should be mopped out with a camel's-hair brush soaked in the solution three or four times daily.

2051. *In Ozæna, Coryza, and Otorrhœa*, when the discharge is fetid, a diluted solution (♏xv.–xxx. ad Aq. ʒj.) proves highly useful. It should not be used so strong as to cause pain.

2052. *In fetid discharges from the Vagina, whether proceeding from an ulcerated state, from Cancer of the Uterus, or from other causes*, a diluted solution (ʒj. ad Aq. ʒxvj.) used tepid or cold, according to the sensations of the patient, forms an excellent injection. It should be of a strength to cause slight tingling without pain. It is equally applicable to *Fetid Discharges from the Rectum.*

2053. *When Ulcers assume a phagedænic or sloughing character, or when they are attended by a profuse and fetid discharge*, a

diluted solution (℥j. ad Aq. ℥viij.) may be applied with great advantage; or it may be applied in the form of poultice.

2054. *In Scarlet Fever*, Sir T. Watson advises a weak solution of chlorinated soda as a gargle; and if the disease occur in a child that is not able to gargle, the solution may be injected into the nostrils, and against the fauces, by means of a syringe or elastic bottle. The effect of this application is sometimes most encouraging; a quantity of offensive sloughy matter is brought away, the acrid discharge is rendered harmless; the running from the nose and the diarrhœa cease, and the whole disease is rendered milder.

2055. *In the Mesenteric Affections of Children*, the solution, in doses of ♏v.–x., with catechu or rhubarb, is reputed to be very effectual in correcting the diarrhœa, and the offensive character of the stools.

2056. *In Syphilitic Eruptions of the Scalp, Lepra, Psoriasis, Lichen, Eczema, and Impetigo*, a practice, which has been found successful, consists in first washing the parts with a diluted solution, then carefully drying the surface and sprinkling it with finely powdered calomel. *In the non-Syphilitic* forms of these affections, as well as in *Pruritus and Tinea Capitis*, the diluted solution (℥vj. ad Aq. ℥xij.) has been found useful.

2057. Sodii Arsenias. Arseniate of Soda.

Med. Prop. and Action. The same as those of arsenious acid, or liquor arsenicalis, but less irritating. Arseniate of soda has been long used on the Continent, and a solution of it has been known and prescribed in this country under the name of Pearson's Solution, a preparation containing one grain of the arseniate to ten fluid drachms of water. Dr. Garrod observes that arsenic in its highest state of oxidation (As_2O_5) is closely analogous to phosphoric acid (P_2O_5), a compound which exists largely in the body. We may therefore suppose that it is less likely to prove irritating than in the condition of arsenious acid, which is one of lower oxidation; that such is the case he found by clinical experiments. In several instances where liq. arsenicalis produced constitutional disturbance, evidenced by nausea, irritation, and swelling of the eyelids, &c., he found that the arseniate of soda in corresponding doses was borne without the slightest discomfort, whilst it appeared to exercise all the curative powers of arsenic. He concludes that the arseniate of soda is less irritating than the arsenite when the amount of arsenic given is the same.

Dose:—Of the Arseniate of Soda, gr. $\frac{1}{16}$–$\frac{1}{8}$. *Of Liq. Sodii Arseniatis*, ♏v.–x. The preparations of arsenic should all be taken immediately after a meal.

2058. *Therapeutic Uses. In Intermittent Fevers, Chorea, Neuralgia, Gastrodynia, Skin Diseases*, and other affections in which arsenic is indicated, and in which the other arsenical preparations are ill borne, the solution (*ante*) may often be resorted to with advantage.

2059. Sodii Bicarbonas. Bicarbonate of Soda. Sesquicarbonate of Soda. (The Carbonate of the shops.)

Med. Prop. and Action. Antacid, alterative, and lithontriptic. When taken in large and long-continued doses it causes derangement of the digestive organs and of the assimilating functions, and induces a state of the constitution resembling that accompanying scurvy. It is frequently employed in

making effervescing draughts; thus, gr. xx. of this salt saturates about gr. xviij. of Tartaric Acid, or gr. xvij. of Citric Acid, or ʒiv. of Lemon-juice. It may also be advantageously administered in the form of Effervescing Solution, B. Ph., prepared by saturating a solution of the bicarbonate (gr. xxx. ad Aq. Oj.) with carbonic acid; this is not to be confounded with ordinary "Soda Water," which is simply a solution of carbonic acid in water. The officinal lozenges contain gr. v. of the bicarbonate in each.

Dose of the Bicarbonate, gr. x.–lx.

2060. *Therapeutic Uses.* *In Acidity of the Stomach*, great relief may be afforded by the administration of gr. x.–xv. of the bicarbonate of soda in some aromatic water, four or five hours after a full meal. *Neuralgia connected with Acidity of the Stomach* is often speedily arrested by a full dose of the carbonate. *In Cardialgia, Flatulence, and Vomiting*, arising from the same cause, it also proves very effectual. *In the Aphthæ of Children*, it often proves effectual combined with a few grains of rhubarb or grey powder. Dr. Ralfe [1] finds from careful experiments that sodium bicarbonate, when given upon an empty stomach, increases the acidity of the urine, while, if administered after a meal, it diminishes it. Basing his conclusions upon these facts, Dr. Ralfe advises sodium bicarbonate should be administered after a meal in cases of acid dyspepsia due to excessive formation of acid in the system, as in *Lithæmia*. On the other hand, he directs the alkali should be given before meals in cases in which there is free acid in excess in the stomach, which hampers the process of digestion. This acid is due usually to fermentation changes in food, or to presence of morbid mucus. The employment of alkalies in checking acid secretions was, however, pointed out by Ringer in his valuable Therapeutics many years back.

2061. *Calculous Disease.* *In the Lithic or Uric Acid Diathesis*, alkalies are clearly indicated, and are often productive of great temporary benefit. As a rule, the bicarbonate of potash is a preferable remedy, as the urate of soda is a much less soluble salt than the urate of potash. The waters of Vichy, which have obtained great celebrity from their known powers of dissolving calculous concretions, are almost entirely composed of soda. The French Codex gives a formula for this celebrated water; it is made of simple acidulous water, impregnated with twice its bulk of Carbonic Acid fʒxxss., Subcarbonate of Soda gr. xxxij., Sulphate of Soda, gr. xvj., Chloride of Sodium gr. iv., Carbonate of Magnesia gr. ss., Chloride of Iron gr. ¼. M. Dr. Drew,[2] himself a sufferer from gout, writing upon that disease, gives his experience of its treatment. He found stimulants—beers, wines, spirits—were one and all obnoxious. Upon giving these up, he still found his joints stiff. He then abandoned the use of sodium salts, reasoning that as he had personally experienced that the carbonate of soda would provoke an attack of gout, so abstention from all salts of sodium should, by starving his organism of those bodies, probably effect the solution of the urate of soda deposited in the tissues for use in the organism. He found

[1] Lancet, Nov. 9, 1878.

[2] Brit. Med. Journ. 1878, vol. ii. p. 689.

that, whether or no his theory was accurate, the practice very speedily resulted in the joints growing supple. He regards all sodium salts as prejudicial to gout.

2062. The saline treatment of *Cholera*, now little in favour, consisted of large doses of the carbonate and chloride of sodium.

2063. *In Dyspeptic Attacks*, and *in Diarrhœa* attended with colic and gastric irritability, flatulence, and especially when this is consequent on the ingestion of unwholesome food, few remedies are more generally useful than a full dose of bicarbonate of soda (gr. xl.–lx.) combined with T. Zingib. Fort. ℥xxx.–xl., and Sp. Ammon. Arom. ℥xl.–lx. In severe cases, a few drops (℥v.–x.) of laudanum may be added. It usually affords speedy relief. *For the Diarrhœa of Children and Infants* a combination of the bicarbonate and Pulv. Cinnam. Co. āā gr. ij.–iv. often proves effectual.

2064. *The Vomiting of Pregnancy* may sometimes be arrested by the carbonate of soda (gr. x.–xv.) with a few drops of laudanum or compound tincture of cardamoms.

2065. *In Diseases of the Skin*, particularly in those of a papular and scaly character, M. Devergie has extensively employed the alkalies both internally and externally. The bicarbonate of soda is the one chiefly used, the corresponding salt of potash being found more caustic and irritant. Internally, the dose is gr. xv. daily, in some bitter infusion, or in syrup (ʒss., Syr. Simp. fʒviij.); and this quantity is augmented gr. viij. every third day, until ʒj. is taken in the twenty-four hours. This is the maximum quantity. Externally, he advises lotions, baths, powders, and ointments. The baths are to contain each from ʒviij.–ʒxvj. of the carbonate, either of soda or potash. The lotions contain ʒij.–ʒiij. of the salt in Oj. of water, and are employed chiefly in *Eczema and Impetigo of the Scalp*. The alkaline powder (1 part of soda, 10 of starch) is used principally as a depilatory, in *Tinea and Sycosis menti*. The ointments are of various strengths, according to the nature of the disease; thus, in *Lichen and its various forms*, the strength is gr. viij.–xv. to ʒj. of lard; in *Lepra, Psoriasis, and Ichthyosis*. gr. xv.–ʒss. to ʒj.; and in *Porrigo favosa*, ʒss,–ʒj to ʒj. with a grain or two of quick-lime. In *Porrigo larvalis*, lotions containing this salt have been found highly serviceable.

2066. *In Albuminuria*, Dr. Osborne advises the following formula:—℞ Sodii Carb., Liq. Potassæ āā ʒij., Decoct. Chondri Crisp. fʒviij. Dose, a tablespoonful every two hours, in milk. When anæmia is very marked, he adds the tartrate of iron.

2067. Sodii Bromidum. Bromide of Sodium.

Med. Prop. and Action. Sedative, anaphrodisiac. In the main its action resembles that of potassium bromide (*q.v.*) M. Laborde [1] asserts he failed in the case of the frog, guinea-pig and dog to obtain toxic symptoms, although he employed double the dose, which, when the potassium salt was used, caused marked toxic effects. Clinical experience does not coincide with these statements.

Dose, gr. x.–xxx.

[1] Journ. de l'Anatomie et de Physiologie, p. 560, 1863.

2068. *Therapeutic Uses. As a sedative and hypnotic in Insomnia.* The uses of sodium bromide are, broadly speaking, similar to those of the bromide of potassium; and this is true in so far as we should prescribe the sodium salt in all cases in which we desired to obtain the physiological effect of bromic acid. The converse is, however, not true. Much of what is known upon this subject is due to the work of MM. Cheron and Fawkner.[1] Prof. Hammond believes the sodium salt acts more powerfully as a hypnotic than does the corresponding ones of potassium.

2069. *In Epilepsy,* Dr. Anstie Hollis draws attention to a most important matter as regards the choice of base in administering bromides. Dr. Hollis[2] shows that heart enfeeblement and actual heart lesion are common complications of epilepsy. Now potassium has been abundantly proved by Ringer[3] and others to be a cardiac depressant. If then bulky doses of potassium be thrown into the organism *qua* the bromide, the heart muscle must have its condition injuriously affected. In Dr. Hollis' cases this actually occurred. Further, in cases in which *anæmia* is present the bromide of iron was advantageously combined with the sodium salt. The formulæ which Dr. Hollis offers are:—℞ Sod. Brom. gr. xv.–xl., Aquæ vel Aquæ Camph. vel Dec. Cinch. Pallid. ʒj. M. Twice daily. (2) ℞ Sod. Brom. gr. xv.–xl., Tr. Cannab. Ind. ♏xv., Aq. ʒj. M. The experience of American physicians seems to be, that although sodium bromide is alike less depressant and less liable to provoke bromism, yet it is certainly not more powerful in controlling epilepsy than is the potassium salt.

2069*. To check *Vomiting* Prof. Field[4] gives ʒss. doses of the bromide in half a tumbler of iced water, and finds it relieves the *vomiting* of women, whether it be *sympathetic* or *stomachic.* In *Sea-sickness* also he finds it useful. Prof. Field considers the sodium salt less apt to produce bromism, while the heart is less affected. With it he has found little, if any, digestive trouble arise. It is, he avers, "the child's bromide." A few grains can be administered in milk to the child without trouble. In *Convulsions,* provided the exciting cause has been sought, and as far as possible removed, the bromides are most useful.

2070. Sodii Carbonas. Carbonate of Soda. Sodii Carbonas Exsiccata. Dried Carbonate of Soda.

Med. Prop. and Action. Antacid, in large doses it is an irritant poison. It is more irritant than the bicarbonate of soda, and is more analogous in its effects to the carbonate of potash. It is sometimes used in making effervescing draughts; thus gr. xx. of the salt saturates gr. ixss. of Citric Acid, gr. xss. of Tartaric Acid, or fʒijss. of Lemon-juice.

Dose:—Of Carbonate of Soda, gr. x.–xxx. *Of the dried Carbonate,* gr. iij.–x.

Therapeutic Uses. Similar to those of Potassæ Carbonas (*q.v.*).

[1] See Journ. de Thérapeutique, Aug. 25, 1881.
[2] Practitioner, vol. i. 1879.
[3] Lancet, Nov. 2, 1882.
[4] Boston Med. Journ. May 1883.

2071. Sodii Chloridum. Chloride of Sodium. Sea Salt. Common Salt.

Med. Prop. and Action. Chloride of sodium performs an important part in the animal economy. It enters largely into the composition of the blood, urine, &c.; and, as Liebig[1] justly observes, "The presence of free muriatic acid in the stomach, and of soda in the blood, proves beyond all doubt the necessity of common salt for the organic purposes. Deprived of it, all animals fade and die rapidly." In moderate quantities (gr. x.–xx.) common salt improves the digestion and increases the appetite; and in larger quantities occasions thirst; and in still larger ones (two or three tablespoonfuls), acts as a powerful emetic. From ʒss.–j. proves cathartic and emetic, and used in the form of enema purges freely. In excessive doses salt is an irritant poison, occasioning inflammation of the stomach and intestines. In many diseases it apparently acts by supplying deficient salt to the blood. Sodium chloride is a chemical *antidote in poisoning by the Nitrate of Silver.* Externally applied, salt is a rubefacient; and salt-water, natural or artificial, has long been employed as a general tonic and discutient, in *Scrofulous Glandular Enlargements, Diseases of the Joints, &c. When leeches have crept into the rectum, or have been accidentally swallowed*, a solution of salt will dislodge and kill them.

2072. *Therapeutic Uses. In Infantile Cholera*, Dr. Dewees states that no remedy is so prompt and so certain as an injection of warm water, in which is dissolved a large teaspoonful of salt. This strength is for a child of one year old; the quantity should be increased in proportion, according to the age of the child. Should it be frequently returned, he advises it to be repeated and persevered in, until it bring away a fæcal or bilious discharge, after which the vomiting, &c., will cease. So decided and effective is this simple plan, that Dr. Dewees states that he has seen it above a hundred times relieve entirely without the aid of other remedies. Its use in *Bilious Diarrhœa* is also advocated by Trousseau, gr. x.–lx. three or four times a day.

2073. *In Fatty Degeneration of the Liver*, Dr. Murchison (p. 51) states that eating large quantities of common salt with food has sometimes appeared useful; and, when circumstances permit, it may be advisable to recommend a trial of the alkaline or saline mineral waters of Carlsbad, Marienbad, Kissingen, Ems, or Vichy. (See Aqua.)

2074. *In Intermittent Fevers*, salt in large doses (ʒviij.–xij. in solution) during apyrexia has been employed with alleged success by several French and American physicians; it is stated not only to control the fever, but to exercise a marked effect in reducing enlargement of the spleen. As an antiperiodic, little reliance is to be placed upon it; the cases recorded show that it may occasionally be useful.

2075. *In Hæmoptysis*, common salt is a popular remedy in some parts of Great Britain; and Dr. Law, of Dublin, states that he has often witnessed its efficacy. Dr. Graves also speaks favourably of it.

2076. *In Ophthalmia*, Dr. Hays recommends a saturated solution of salt as a collyrium. *In Chronic Granular Ophthalmia* in particular, he employed it in numerous cases with the most striking

[1] Animal Chemistry, p. 161.

benefit. Dr. Rothmund has successfully employed a sub-conjunctival injection of chloride of sodium (gr. xx., Aq. ʒj.) for promoting the absorption of the diffuse *Corneal Opacities consequent upon Parenchymatous Inflammation.*

2077. *Against Worms*, salt proves very effectual. Coloured with cochineal, in doses of ʒss., and that given on an empty stomach, it is an effectual means of destroying round worms. It is said not only to expel worms but to prevent their reproduction. With children, salt given in an enema of water is effectual against thread worms.

2078. Sodii Ethylatis, Liquor. Solution of Ethylate of Sodium.

Med. Prop. and Action. Caustic. It is prepared by the action of absolute alcohol upon pure metallic sodium. It occurs in crystals, which, when acted upon by water, undergo decomposition, sodic hydrate and ethylic alcohol resulting. Upon this fact the action of sodium as a caustic admits of ready explanation. When the skin is dry no caustic action occurs, when it gives up moisture the caustic soda is then formed, and at once acts upon the skin. It was first incorporated into the B. Ph. in 1885.

2079. *Therapeutic Uses.* As a *Caustic for Nœvi*, &c., Dr. B. W. Richardson introduced sodium ethylate to the profession.[1] He employs it as a caustic. He says it dissolves the alkaloids and opium readily, so that it is possible to obtain a caustic action concurrently with a condition of deadened sensibility. For *Nœvi*, painting over with ethylate of sodium produces a rapid eschar, and usually gives little pain. If the pain is at all bad, chloroform dropped upon the part assuages it at once by decomposing the ethylate. Dr. Brunton,[2] who has used ethylate of sodium in the treatment of the same class of cases, highly commends it. It has no action he finds on healthy skin. Dr. Grose, of Melksham, finds that the ethylate application, although effectual, often causes agonizing pain. He also applied it to an *Epitheliomatous Ulcer.*

2080. Sodii Hypophosphis. Hypophosphite of Soda. Potassii Hypophosphis. Hypophosphite of Potash. Calcis Hypophosphis. Hypophosphite of Lime.

Med. Prop. and Action. These are the principal "Alkaline Hypophosphites" which have of late years been introduced into medical practice; and as they are closely allied in medical properties and uses, they may be conveniently considered together. They belong to the class of nervine tonics: in the words of Dr. J. F. Churchill, who has brought them prominently into notice, "they increase the nervous force, and are the most powerful hæmatogens, possessing all the therapeutic properties of phosphorus." The potash salt appears to act far more energetically as a liquefacient than the other two, so much so, indeed, that Dr. Thorowgood states that he has known great mischief result from its incautious administration to persons affected with tubercular deposit in the lung. As a gradual tonic and restorer of failing nerve force, he prefers the hypophosphite of soda or of lime to the potash salt, and either of these he considers will answer all the purposes of pure phosphorus as an internal remedy, while at the same time they are more manageable and agreeable medicines. According to Mr. Taylor, who has carefully examined the properties of these salts, the soda hypophosphite is best adapted for blood dis-

[1] Lancet, Nov. 9, 1878. [2] Paper read before Med. Soc. of London, Oct. 28, 1878.

eases, and those of potash, lime, and ammonia for those of the secretory organs. They are all very soluble (more so, it is stated, than any of the oxides of phosphorus) in the animal fluids, and are readily admitted into the circulation. Their assimilation is promoted by sugar, which has the additional recommendation of disguising the taste, which to many persons is very objectionable. The hypophosphites were at one time held to act specially in phthisis. It is, however, more than probable that they all become oxidized in their passage through the alimentary canal, and hence act in the same way as the phosphates.

Dose:—Of either of the Hypophosphites, gr. ij.–xv. in a bitter infusion, in sweetened water, or camphor water. *Of the Syrup*, ʒj.

2081. *Therapeutic Uses. In Phthisis*, the alkaline hypophosphites were introduced by Dr. Churchill as *curative* in every stage. This contention, however, cannot be admitted without reservation. In *Acute Tubercular Phthisis* and in *Caseating Pneumonia*, the hypophosphites are useless. In other forms they are useful in proportion to the power they possess of increasing the body's nutrition. The phosphates and hypophosphites have, however, a very important function to perform in the treatment of phthisis, since they constitute some of the most valuable tonics which we possess, and appear to guard the body from waste. Viewed in this light the hypophosphites must be conceded as useful in phthisis. Dr. Thorowgood also regards the hypophosphites as valuable, especially in the prèmonitory and early stages of the disease; but the experience of Dr. Quain, Sir Risdon Bennett, and Dr. Cotton, each of whom gave them a fair trial, is adverse to their utility. Indeed, when tubercular softening has commenced, they seem in some cases to act prejudicially. *In Chronic Bronchitis*, however, they often act beneficially. In an obstinate case with thick fetid expectoration and tendency to congestion of the lung, in the practice of Dr. Thorowgood, the hypophosphite of potash (grs. v.) in camphor water, effected a complete cure without any other medication whatever. In other cases remaining after an acute attack, and not as a rule complicated with emphysema of the lung, he states that he has given the potash salt in camphor water with much advantage. The syrup of the hypophosphites will sometimes produce tormina, which is, Dr. Bartholow finds, remedied by the addition of phosphoric acid. He suggests ℞ Syr. Hypophosph. Co. ʒiijss. Ac. Phosph. D. ʒss.–ʒj., three times a day.

2082. *In cases of Nervous Depression and Torpor, with occasional Shooting Neuralgic Pains, and in other cases of Numbness and Deadness of the Limbs, arising from Feeble Circulation*, the hypophosphites prove useful, and the lime or soda salt may be given according as the stomach will bear the one better than the other. When anæmia is present, the citrate of iron can be added to the soda salt, or else the syrup of hypophosphite of iron, or of iron and quinine, can be employed: either of these syrups will prove an active tonic, removing neuralgic pains, chest oppression, and languor of circulation in a very evident way. (Thorowgood.) Severe cases of neuralgia of the back and thighs are reported to have been cured by ʒj. doses when other remedies failed. *In Chorea*, it is favourably spoken of by Dr. Radcliffe; he combines it with cod-liver oil (*q.v.*).

2083. *In the Remittent Fevers of Childhood* the hypophosphites are useful. They have a marked effect in quieting the patient. The following formula is suitable for an infant, the dose being increased according to age:—℞ Sodii Hypophos. gr. vj., Calcis Hypophos., Potass. Hypophos. āā gr. iv., Glycerini ʒij., Aq. ʒj. Dose, xl. drops thrice daily in a little water.

2084. *In Tabes Mesenterica*, the hypophosphites act slowly but surely, according to Dr. Purdon. He considers that they act by dissolving the tuberculous matter deposited in the abdominal viscera, possibly by causing disintegration of fibrin.

2085. *In Debility resulting from Prolonged Lactation, in some forms of Dyspepsia, Anœmia and Leucocythœmia, in Catarrhal and Leucorrhœal Discharges, in Myalgia and muscular Pains simulating Inflammation*, Mr. Taylor resorted to the hypophosphites with more or less marked benefit; in fact, in all cases where there is reason to suppose the phosphates to be morbidly deficient, they may be prescribed with a good prospect of success. The demand for the phosphate of lime in the construction of the teeth contributes to the disturbing influence called the *Fever of Dentition;* in this also, whether it occurs in weakly, ill-fed children, or in the robust, Mr. Taylor employed these salts with marked success; in the former class he combined them with some tonic or aromatic tincture, in the latter with acetate of ammonia or syrup of rhubarb.

2086. *Pernicious Anœmia* is reputed to be greatly benefited by the administration of phosphate and hypophosphite of the alkalies.

Sodii Hyposulphis. Hyposulphite of Soda. See Sodii Sulphis.

2087. Sodii Iodidum. Iodide of Sodium.

Med. Prop. and Action. Dr. Gamberini, of Bologna, draws the following conclusions:—1. Soda being a very common ingredient in the organism, the iodide of its base appears to be best suited to the human system. 2. Its taste is much less disagreeable than that of the iodide of potassium. 3. It is less likely to occasion iodism. 4. It is better borne than the potassium salt, and consequently its dose can be almost daily increased; it thus becomes a more efficient remedy. 5. It has sometimes succeeded where the iodide of potassium has failed. 6. It may be given daily in three equal doses, gr. xx. of the salt to ʒiij. of water, increasing the strength of the solution every two or three days by six grains. Some patients have in this manner been able to take ʒij. daily without the slightest inconvenience. 7. It is admirably adapted to cases in which the corresponding salt of potassium is indicated. 8. It is the best substitute for mercury. (See also remarks on Sodii Bromidum.) This salt was introduced into the B. Ph. in 1885.

Dose, gr. iij.–x., or more.

2088. *Therapeutic Uses. In Constitutional Syphilis* the effects are on the whole, highly satisfactory. Like other remedies of the same class, it affords no security against relapses. In nineteen cases of *Secondary Syphilis affecting the Bones and Periosteum*, this salt was administered by Dr. Daveri,[1] who states that, compared with the iodide of potassium, it is equally beneficial, whilst it is

[1] Bull. delle Sci. Med. xix. p. 269.

far more palatable. From the larger doses in which it can be administered, the treatment was found to be much abridged.

2089. *In Lead Poisoning*, M. Rabuteau[1] regards this salt as safer than the iodide of potassium, and at the same time no less effectual.

2090. Sodii Nitris. Nitrite of Sodium.

Med. Prop. and Uses. This salt occurs as a white deliquescent powder. It is soluble in water, and when taken into the mouth gives a sensation of cold to the mouth and fauces. Its physiological effects have been carefully studied by Drs. Ringer and Murrell, and may be briefly summarized as follows:[2]— Toxic doses produced panting respiration, slaty coloured cyanosis of the mucous membranes, and wide dilatation of the pupils. Convulsions opisthotonic in character followed, the animal finally succumbing. Its blood had assumed a chocolate hue. Reichert has shown that the nitrite possesses the power of ousting the oxygen from oxyhæmoglobin, forming nitrite-hæmoglobin, and thus reducing the arterial and the venous blood to the same hue. Patients who took toxic doses complained of giddiness; there was cyanosis of ears, face, lips, nails, &c. Throbbing pains in the head, with præcordial fluttering, were marked. Profuse perspirations also occurred; severe headache, and nausea without vomiting, appeared in some of the cases.

The dose should be gr. ij.-iij., cautiously increased to gr. x., of the pure nitrite. The earlier preparations were impure, hence large doses were borne.

2091. *Therapeutic Uses. In Angina Pectoris*, Dr. Hay has shown the use of this remedy. The close chemical relationship which exists between nitrite of amyl and nitrite of sodium, would suggest that in cases in which one was of service the other would show itself to be at least as effectual. Dr. Hay, in a series of most able papers,[3] seeks to establish the value of nitrite of sodium in the treatment of *Angina*. Not only does he find that it produces a marked and beneficial effect, but an effect which he believes is more permanent than that following the use of nitrite of amyl. It has as yet been little employed in other maladies. There is no doubt of its great value, nor of its vigorous and perilous effects if the dose be allowed to rise too high. In the earlier records the nitrite was largely mixed with nitrate, a feeble salt, so that doses were tolerated which, when consisting of pure nitrite, give rise to very unpleasant symptoms.

2092. *In Epilepsy*, Dr. Law[4] recommended nitrite of sodium, and published cases which ameliorated during its use. Other observers, and among them Dr. Murrell, have confirmed Dr. Law's results. Dr. Ralfe[5] states that nitrite of sodium succeeds when potassium bromide fails, and has recorded cases illustrative of his assertion. It must be remembered, however, that his cases were few in number (17), and were only under observation a short time. Further, other observers, Buzzard, Gowers, Ramskill, &c., have failed to produce lasting benefit from the employment of the drug.

[1] Practitioner, July 1868; and Brit. Med. Journ. Dec. 24, 1878.
[2] Lancet, 1883.
[3] Practitioner, March, May, June 1882.
[4] Practitioner, vol. i. 1882.
[5] Trans. Med.-Chir. Soc. 1882.

2093. *In Epileptiform Convulsions*, the use of nitrite of sodium seems in some cases serviceable, but the opinion in its favour is by no means unanimous.

2094. Sodii Phosphas. Phosphate of Soda.

Med. Prop. and Action. Purgative in doses of ℥¼-j., acting mildly and efficiently: it has the advantage of possessing a taste so similar to common salt, that it may be given in broth or soup, without being distinguishable from the latter. It is an important salt in the animal economy, and one often very deficient in the food of children. Phosphate of sodium increases the alkalinity of the blood. (Böcker.) Under its use, according to Prof. Parkes, the proportion of urea in the urine becomes diminished, due, it is believed, to diminished retrograde metamorphosis.

2095. *Therapeutic Uses. As a Solvent of Uric Acid Deposits*, it was first proposed by Liebig, and it has been used in these cases with apparent benefit. Dr. Golding Bird employed it in two cases, with the effect, in one of them, of rapidly causing the disappearance of the uric-acid deposit when many other remedies had previously failed. It (grs. xx.–xxx.) may advantageously be given in broth. Dr. Roberts, of Manchester, has shown that, by giving the alkalies in sufficient quantity, the urine may be kept alkaline, and in this case renal calculi, which are composed mainly of uric acid, will become dissolved.

2096. *In the Visceral Affections of Childhood*, Dr. Stephenson has called attention to the value of the phosphate in small doses, grs. iv.–v. (a pinch) being given with each article of food. It was ordered in cases when from an unhealthy character of the motions the visceral secretions seemed to be abnormal. The uses of phosphate of soda in the treatment of diseases of children have been considerably developed. In the treatment of *Strumous Diathesis*, in *Rickets*, in *Chronic Malnutrition*, the phosphates [Parrish's chemical food] justly occupy a high place. The phosphates are tonic, and tend to tissue formation and tissue preservation.

2097. *In Cirrhosis of the Liver*, Dr. Bartholow believes he has seen good results occur from the administration of sodium phosphate in this disease, and indeed he thinks the drug will in some cases effectually check the morbid process.

2098. In other *Liver Affections*, phosphate of soda was found by Rutherford[1] to be cholagogue. Its use has been recommended by Dr. Thudichum[2] in *Gall-stones*. He gives it in broth, like common salt, which it resembles in taste. In the *Jaundice of Children*, Dr. Stephenson found it most serviceable.

2099. Sodii Salicylas. Salicylate of Soda. Obtained by acting on Sodium Carbonate with Salicylic Acid.

Med. Prop. and Action. Antipyretic, antiseptic, and anti-ferment. The sodium salt has very much weaker antiseptic powers than the acid (*q.v.*) Its physiological action is that of the acid. It occurs as small crystalline scales, which are almost colourless, and freely soluble in water.

Doses, gr. x.–xxx.

2100. *Therapeutic Uses.* (See Salicylic Acid.)

[1] Practitioner, vol. ii. pp. 78, 79. [2] Lond. Med. Rec. 1860, vol. ii. p. 123.

2101. Sodii Sulphas. Sulphate of Soda. Glauber's Salt.

Med. Prop. and Action. Purgative, in doses of ʒss.–j.; but when dried so as to expel the water of crystallization, half these quantities are sufficient. Its unpleasant taste, which is a great objection to its use, may be partially disguised by the addition of lemon juice. It is particularly adapted for febrile and inflammatory states, when it may be advantageously combined with cream of tartar. In small doses largely diluted it acts as a diuretic.

Dose:—As a purgative, ʒss.–j.; *as a diuretic*, gr. lx.–cxx.

2102. *Therapeutic Uses.* Similar to those of Magnesiæ Sulphas, *q.v.*

2103. *In Opacities of the Cornea*, Dr. H. Power[1] reports very favourably of the powdered sulphate locally applied. One or two grains should be introduced at a time into the eye. The most convenient mode of application consists in everting the upper eyelid, brushing the powder lightly over the surface with a camel's-hair pencil. This may be repeated every morning or every other morning, or twice a week, according to the degree of reaction that follows. It causes, in all cases, much redness and pain, with lacrimation lasting half an hour or more. Should these be too violent, its action in subsequent applications may be lessened by adding a little starch, or by using a solution (gr. v. ad Aq. ʒiv.) After its use for some weeks the opacity becomes fainter and vision restored. Its action is apparently that of an irritant, not of a solvent. As a remedy for *Cataract*, Prof. Polli,[2] of Milan, suggests that a solution of this salt might be injected into the anterior chamber of the eye, with the hope of dissolving the nebulous matter of cataract.

2104. Sodii Sulphis. Sulphite of Soda.

Sodii Bisulphis. Bisulphite of Soda.

Sodii Hyposulphis. Hyposulphite of Soda.

Med. Prop. and Action. These salts, as well as the corresponding salts of magnesia and lime, which are all included under the general term "Alkaline Sulphites," have attracted considerable attention, mainly, in the first instance, on the recommendation of Prof. Polli,[3] of Milan, who asserts that the sulphites taken internally, in their passage and decomposition in the system, become possessed of all the properties of free sulphurous acid, with this advantage over it, that their action is more uniform, more constant, and even more intense; and further, that they may be given in large doses for a lengthened period without the slightest inconvenience. In his own person he took daily about 225 grains (15 grammes) of the sulphite of magnesia. The results were, that he lost all feeling of thirst, the excrements lost their usual fæcal smell, which was replaced by that of sulphuretted hydrogen, and the urine excreted during its use remained fresh, acid, and clear, and did not undergo ammoniacal fermentation for eight or ten days during the hottest Italian summer, whilst that excreted before, and some days after the sulphites had been discontinued, became ammoniacal, fetid, and covered with fungoid growths in from five to seven days. In another series of experiments he tried the effects of the sulphites as prophylactics, and as curative agents on animals in whom a septic disease had been artificially induced, by the injection into

[1] Practitioner, Sept. 1868.
[2] Practitioner, Aug. 1868.
[3] Brit. Med. Journ. Nov. 16, 1867.

the veins of different animal poisons, such as putrid blood, fetid blood from unhealthy abscesses, and the discharge from glandered horses. The result of these experiments, practised on dogs, and variously conducted, proved that the sulphites had the power in some instances of entirely preserving the animal from the action of these morbific agents, and in others of enabling the animal, after a short illness, to regain its health; while in almost every instance of septic injection the sulphites sufficed to effect a more or less rapid cure of the induced fever. From the undoubted power of sulphurous acid to destroy all the lower forms of organic life, it is thought by many that the sulphites act by destroying the germs of the organic poisons, or ferments, as they are termed by Prof. Polli, in which zymotic diseases are supposed to have their origin. This view is opposed by Polli, who contends that they act by modifying the aggregation of the material components of the organism, rendering it, by their presence, incapable of being acted upon by those catalytic germs.

Taken internally, the sulphites are readily absorbed, and appear in the urine unchanged in about twenty minutes after they have been swallowed, but they are partially changed in the system into sulphates. The saliva and sputa contain them. They are not decomposed in the stomach ordinarily, but when they are so, there is a manifest production of sulphurous acid gas; when this is the case, a little magnesia should be added to the sulphite to neutralize the acids of the stomach. The sulphites of soda and magnesia are tolerated in large doses if dissolved freely in water; a concentrated solution is apt to lie heavy on the stomach, and cause a frontal headache. They are decomposed by all the vegetable acids, however weak; hence in fevers, &c., the ordinary lemonade and all acidulated drinks should be carefully avoided, as these destroy their efficacy.

The hyposulphite of soda is much more purgative than the sulphites of magnesia and soda, which are commonly more diuretic than cathartic in their action. There are individuals, however, whose intestinal canal is very sensitive to their action, in which cases a carminative and sedative are required to be combined. The purgation, however, is commonly without pain or discomfort: the stools under the use of the sulphites lose all cadaveric or nauseous fœtor. The best mode of administering the sulphite of magnesia is in the form of powder, because of the large quantity of water it requires for solution, and because in that state it is least easily altered by the air. This sulphite has the least taste, and is the most active of all; and, since it undergoes in the dry state the least change, it is to be preferred to all others for medicinal purposes. Grs. xv.–xxx. may be prescribed in powder, to be taken in water or other vehicle, or it may be covered with gum or dextrine, and sugared, and taken as troches or jujubes. The sulphites are better than the hyposulphites when a rapid curative action is required, but the latter may be advantageously substituted when prophylaxis is aimed at. The great object in administering them curatively is to saturate the system with them, and for this purpose ʒiv.–v. daily should be the minimum quantity for an adult. Three or four times that quantity of the magnesia salt have, however, been given with advantage, and a third or fourth more (ʒv.–vij.) of the sulphite of soda will be borne well. Their long-continued use is apt to induce œdema and diseases of debility, by their deoxidizing qualities.

Locally applied to ulcerated surfaces, &c., the sulphites in solution (ʒj.–ij. ad Aq. Oj.) act as a stimulant to healthy action, sedative, and deodorizer; for this purpose the soda salts are preferable to the magnesia, as being more soluble. Their powers as antiseptics are very marked. Prof. Polli states that corpses or viscera intended for anatomical use can be preserved for many weeks in solution of the sulphites of magnesia or soda, without change either in colour or density, or otherwise, and further, without acting upon the knife when dissection is made.

Doses:—See preceding section.

2105. *Therapeutic Uses. In Typhus Fever*, grand results were anticipated from the use of the sulphites; but those which were obtained

show that the sulphites are almost useless. *In Scarlatina*, the facts adduced by Dr. De Ricci and Dr. Cummins serve to establish the efficacy of the alkaline sulphites, both as curative and prophylactic agents. *In Smallpox, Measles, and Erysipelas*, Dr. Polli speaks of the sulphites as mitigating the febrile action, rendering the confluent and malignant forms benignant, shortening the course of the milder forms, and in all cases accelerating convalescence. *In Puerperal Fever*, they have been advised. How far they are beneficial when the fever is fully established is questionable; but there can be little doubt of their value as a prophylactic and curative in the early stages, when used in solution in the form of injections into the uterine cavity, so as to remove all noxious matters. A tepid solution of any sulphite or of hyposulphite of soda should be used every day or oftener. This treatment is advocated by Dr. Snow Beck, who advises, at the same time, the internal use of the sulphite of magnesia or lime (gr. xx.–xxx. every two or three hours). Cloths soaked in a solution of hyposulphite of soda and applied externally to the parts, are advocated by Dr. C. Paul, as a means of preventing puerperal infection. In all these cases it appears essential to the success of the remedy that it should be given early in the attacks, the earlier the better, and all vegetable acids carefully avoided.

2106. *In Intermittent and other Malarious Fevers*, Dr. Polli adduces much evidence in favour of the curative and prophylactic power of the sulphites. They were found, it is stated, to cure a larger number of cases than quinine, to cure more completely, with less tendency to relapse, and to succeed when quinine failed. In other cases their conjoined administration effected a cure when neither cured singly. The sulphites do not, like quinine, cut short the fevers; they gradually diminish the intensity of the symptoms. The sulphite of magnesia is most effectual, ʒj.–jss. in divided doses daily in water or sugar. It may be taken during the accession as well as during the remission. As a prophylactic, Polli prefers the hyposulphite of soda in solution, taken every morning fasting in a cup of water. This treatment proved successful in the hands of Drs. Turner, Hampton, and other American physicians.[1]

2107. *In Gangrenous, Phagedœnic, and foul Ulcerations*, a solution of the sulphite of soda (1 part to 5 or 10 of water), applied locally as a wash or kept in contact by compresses soaked in it, are said to very useful in destroying the fetid odour, and establishing healthy action, whilst, at the same time, it soothes the pain. In mild cases a weaker solution (ʒj., Aq. Oj.) will suffice. Sulphite of magnesia (grs. xxx. every two hours) may be given internally.

2108. *In Diphtheria*, Mr. Maynard found great benefit from hyposulphite of soda locally applied. In the very early stages he employs the following solution:—℞ Sodii Hyposulph. ʒij., Glycerini ʒij., Aq. ʒvj. M. In advanced cases he washes the throat out well with warm water by means of a flexible syringe,

[1] Practitioner, July 1868.

and then dresses the affected part with this solution, using at the same time a gargle: ℞ Sodii Hyposulph. ʒj., Glycerini ʒj., Aq. Oj. M. The effect of this solution upon the exudation, he observes, is most marked; it appears to solidify and dry up the false membrane, and when the syringe is again used, which it should be frequently, the force of the water will either wholly or partially wash it away. The exudation rarely re-forms, and the patient makes a comparatively rapid recovery. Where there was much swelling, the extract of belladonna applied externally proved very useful. The constitutional treatment should be stimulant and nutritive.

2109. *In Dyspepsia,* Dr. Brinton observes that the hyposulphite appears to substantiate the claims made for it by Sir W. Jenner, as a remedy against flatulent dyspepsia; its efficacy seeming due to its powers of checking decomposition in the food, as well as to its effects on the stomach itself. It may be given in the same way as the alkaline carbonates, the effects of which, he remarks, are somewhat similar.

2110. *In Chronic Cystitis,* when the urine decomposes before it is eliminated, Mr. L. Wilcox[1] has found by the use of the sulphite all putridity disappears, and the urine becomes clear and odourless.

2111. *In all Diseases of the Skin of Vegetable Parasitic Origin, e.g., Porrigo,* the local application of solutions of the sulphites is indicated. *In Tinea tonsurans, or Ringworm,* Dr. Tilbury Fox[2] used the following:—℞ Sodii Hyposulph. ʒj., Aq. ʒxij. M. He states that *Chloasma* is easily curable by its means. He directs the skin to be first washed with yellow soap and water, and the lotion at once applied, the part being frequently dabbed with it. It is a good plan to sponge the skin just before using the lotion with a little weak vinegar. Dr. Frizell[3] (U.S.) relates a case of *Pruritus Pudendi* cured by the following:—℞ Sodii Sulph, ʒj., Aq., ʒiij., Glycerini ʒj. M. It has also been found useful in *Sycosis.*

2112. Sodii Sulphocarbolas. Sulphocarbolate of Sodium.

Med. Prop. and Action. This and the corresponding salts of other bases, as ammonium, potassium, and zinc, have been brought forward by Dr. Sansom[4] as a means whereby carbolic acid may be introduced into the system without the disadvantages which usually attend its administration in the uncombined state. It is, however, very doubtful whether carbolic acid is liberated, as none of the constitutional effects of that drug develop themselves during the administration of sulpho-carbolates.

Dose:—Of Sulphocarbolate of Sodium, gr. xx.-lx.

2113. *Therapeutic Uses.* Those of carbolic acid (*q.v.*). Amongst the diseases in which it has been successfully employed by Dr. Sansom, are *Phthisis, Ulceration of the Tonsils, Diphtheria, Scarlet Fever,* and *Erysipelas.* Its use in *Zymotic Diseases* is stated to have been "unexceptionally favourable."

2114. As local applications to *Inflamed Mucous Membranes*

[1] Practitioner, Oct. 1868.
[2] Practitioner, March 1870.
[3] Braithwaite's Retrosp. lv. p. 343.
[4] Practitioner, July 1869.

sulphocarbolates are very useful. Dr. Bartholow has used them with advantage in *Tonsillitis, Nasal Catarrh, Otorrhœa, Gonorrhœa,* and *Aphthous Ulceration of Children.*

2115. *In Dyspepsia,* Dr. Ringer finds gr. x.–xv. taken before a meal will prevent *Flatulence and Distension* which are so painful to many dyspeptics.

STARCH AND GLYCEROLE OF STARCH. (See AMYLUM.)

STAPHISAGRIA. (See DELPHINIUM STAPHISAGRIA.)

2116. STRAMONII FOLIA ET SEMINA. The dried leaves and ripe seeds of the Thorn-apple, Datura stramonium, *Linn.*

Med. Prop. and Action. Anodyne and antispasmodic. Active principle, an alkaloid, *Daturine,* which is closely allied to, if not identical with, atropine. In large, or long-continued doses, stramonium causes dilatation of the pupil (an effect which follows its local application), great disturbance of the cerebral functions, delirium, coma, and death. It will often act as a narcotic and anodyne where opium or belladonna fails. The best form for internal use is the extract; it is advisable to commence with a small dose (gr. $\frac{1}{4}$), and gradually to increase the quantity until it produces some obvious effect. It may also be smoked in a pipe, and the fumes inhaled; for this purpose gr. x.–xxx. of the leaves is sufficient; but it should be used with great caution, and immediately discontinued if it cause vertigo, dryness of the throat, and dilatation of the pupils. Externally, the leaves, either in the form of fomentation or cataplasm, are a valuable anodyne. Caustic fixed alkalies destroy its activity in the same manner as they do that of belladonna (*q.v.*).

The symptoms and treatment of poisoning by stramonium are similar to those of belladonna (*q.v.*).

Dose:— Of the Powdered Leaves, gr. j.-iij. *Of the Extract of the Seeds,* gr. $\frac{1}{4}$–$\frac{1}{2}$. *Of the Tincture,* ♏x.–xxx.

2117. *Therapeutic Uses. In Asthma,* smoking stramonium, introduced in 1802 by General Gent, is a remedy of much value, though not uniformly so. It is especially useful in cases where there is no organic disease. Dr. Hyde Salter found the seeds of use when the leaves fail. He commended smoking them in a pipe, and stated that a pipe of tobacco mixed with some stramonium should be taken before going to bed, and that such a practice wards off an attack. A pipe ready charged should be ready at the bedside, in case of a paroxysm occurring in the night. It is more useful when taken at the commencement of an attack. From gr. x.–xx. of the dried leaves is sufficient for a time. Caution is necessary in its use, and it should be at once discontinued if it produces any ill effects. It is also of use in *Hay Asthma.*

2118. *In Chronic Bronchitis* of the old, where there is great dyspnœa, accompanied by a dried state of the tubes, Dr. Headland found the tincture (♏x.), combined with expectorants, very useful. *Chronic Coughs,* under the same circumstances, especially if of a spasmodic character, are often relieved by smoking stramonium. *In Emphysema of the Lungs,* Dr. Waters speaks very favourably of this practice for the relief of asthmatic symptoms; he states that he has very constantly found that smoking stramonium just before going to bed has had the effect of giving the

patient a good night, and of preventing an attack of dyspnœa. *In the Dyspnœa of Phthisis*, Sir J. Clark derived great benefit from the extract, gr. ¼–j. daily, when the dyspnœa is constant.

2119. *In Neuralgia*, stramonium was proposed by Dr. Marcet, who employed the extract (gr. ⅛–½ thrice daily) with success. It may be applied locally in the same manner as belladonna (*q.v.*).

2120. *In Insanity*, gr. j. doses are sometimes useful as a soporific. Probably, daturin is the best form in which to give it (gr. $\frac{1}{120}$–$\frac{1}{60}$). *In Acute Mania*, it may be given hypodermically, but is less useful than atropine or hyoscyamine (*q.v.*).

2121. *In Dysmenorrhœa*, stramonium has been given internally. It is stated that, in the severe forms of the disease, stramonium has been productive of the most marked good effects.

2122. *In Diseases of the Eye, in Cataract, Iritis, deep-seated Ulcerations of the Cornea*, &c. the local application of an aqueous solution of the extract proves useful, from its power of dilating the pupil. It is an excellent substitute for belladonna, although it is generally regarded as inferior by British practitioners.

2123. *In Dracunculus or Guinea-worm*, Mr. Forbes recommends poultices of bruised stramonium leaves. He states that he has long employed them with decided advantage; leeches and fomentation only being had recourse to when inflammation exists in the neighbourhood of joints.

2124. *In Cancerous Ulcerations*, the following ointment, in use at the Middlesex Hospital, is very effectual in the relief of the great pain:—Take of fresh stramonium leaves lb. ss., lard lbs. ij.; mix the bruised leaves with the lard, and expose to a mild heat till the leaves become friable, then strain through lint. The ointment thus prepared is spread upon lint, and the dressing changed thrice daily.[1]

2125. *To painful Nodes and Rheumatic Swellings, particularly when they partake of a Syphilitic character*, a datura leaf, moistened in spirit and bound over the painful part, often affords very great relief. Fomentations of the leaves (℥j. ad Aq. Ferv. Oj.) may also be employed with benefit. *To painful and irritable Piles*, an ointment, composed of one part of the powdered leaves and four of lard, is a useful anodyne application, but its use requires caution.

2126. STRYCHNINA. Strychnine. An alkaloid obtained from Nux Vomica. It exists also in other species of Strychnos.

Med. Prop. and Action. Similar to nux vomica (*q.v.*). When taken in poisonous doses, the symptoms which ensue are more or less as follows:—If taken in solution it has an intensely bitter taste. After a certain interval, often without any warning, a sense of suffocation occurs, and the muscles of the head and limbs, if not of the entire body, are affected with tremblings and twitchings. In a little while longer, tetanic convulsions seize almost the entire frame, and the body becomes rigidly fixed, with the head bent backwards, the body also arched backwards (opisthotonos), the hands clenched, the soles of the feet incurved, the face congested, and the expression of the countenance

[1] Lancet, Aug. 8, 1868.

caused by the spasmodic contraction of the muscles, that of the *sardonic grin*. There is heat and dryness of the fauces, and sometimes frothing at the mouth, with fixidity of the jaws, and an anxious feeling of impending suffocation. The intellect is generally but little or not at all affected during the intermissions; on the contrary, the external senses are usually exceedingly acute. The fits last from half a minute to two or more minutes, and recur at shorter and shorter intervals, and are longer continued towards the end. In the intervals the patient feels exhausted and terribly anxious; he generally knows when a paroxysm is coming on, and cries out either to be held or that he will die. Very slight causes, even a sudden light touch, may produce a paroxysm, yet to be firmly held or to be rubbed is generally desired. Death either takes place by asphyxia during a paroxysm, or by exhaustion in the interval. These symptoms generally supervene within from five to twenty minutes after its ingestion, and in fatal cases death generally occurs within two hours. The *post-mortem appearances* present nothing uniform or remarkable, some turgescence of the vessels of the brain, occasionally effusion, in some instances inflammation of the alimentary canal, and in a few, softening of the brain and spinal cord have been observed.

Treatment by poisoning by Strychnine.—If seen early enough, the stomach pump is to be used, and emetics, of which Apomorphine is the best (♏v. of the 1 in 50 solution), Animal Charcoal, or Tannic Acid, *ad lib.*, Bromide of Potassium, or Chloral administered, or the patient can be narcotized with Chloroform. Artificial respiration is to be practised. Lutidine, prepared by distilling Cinchonine with Caustic Potash, is said by Williams and Waters to be an antidote to strychnine.[1]

2127. *Remarks on the Use of Strychnine.* 1. Some constitutions are peculiarly susceptible to its action; hence it should always be commenced in the smallest doses, and be gradually and cautiously increased, its effects being carefully watched.

2. Muscular stiffness or convulsive twitchings in the extremities is a certain indication that the remedy has been carried to its full extent. It should then be either suspended or discontinued.

3. Dangerous, if not fatal, results may supervene suddenly after it has been continued in ordinary doses for some time, especially when given in the form of pill.

4. As a general rule, it is best exhibited in a liquid form—the officinal solution.

5. Its full effects are rapidly developed when introduced into the system hypodermically. For this purpose the proper form is a solution of the sulphate (gr. ij., ad Aq. dest. ʒj.), and the proper commencing dose ♏ij. (gr. $\frac{1}{150}$). Unpleasant toxic effects result if the dose be carried beyond gr. $\frac{1}{60}$th. (Dr. Anstie.)

6. During a course of strychnine the use of tobacco in all forms should be abandoned, its operation on the system being antagonistic.

7. It may often be advantageously combined with iron, quinine, and cod-liver oil.

Dose:—*Of Strychnine, or its salts*, gr. $\frac{1}{30}$–$\frac{1}{15}$. *Of the Solution of the Hydrochlorate*, ♏v.-x. For hypodermic injection, gr. $\frac{1}{120}$ (see *ante*).

2128. *Therapeutic Uses.* *In Paralysis*, strychnine has been used with very different results by different practitioners. This may arise from three causes—1, the impurity of the drug; 2. the inability of the constitution to bear the remedy; 3, its injudicious application to all forms of paralysis. It is serviceable in *Paretic conditions remaining after Hemiplegia* (Andral). *In Chronic Lead* or *Mercury Poisoning* strychnine is valuable, and in most conditions of the nervous centres, when the tone rather than the functional activity is depressed. Sir T. Watson has pointed out that

[1] Proc. Roy. Soc. vol. xxxi. p. 162.

it is useless *in recent Hemiplegias*. It may be commenced in doses of $\frac{1}{32}$—$\frac{1}{16}$ of a grain, twice or thrice daily, and the quantity increased cautiously. After continuing the medicine for a few days or a week, slight convulsive twitchings, or a creeping sensation, will be experienced in the paralytic limb. The remedy should then be discontinued for two or three days, and resumed as before. Mr. C. Hunter advocates its employment hypodermically, and he remarks that if after three or four injections improvement does not take place, it is almost useless to continue its employment.

2129. *In Amaurosis from Nerve Exhaustion*, strychnine occasionally proves useful. Dr. Julius Chisholm treats *Muscular Asthenopia*, *Tobacco Amaurosis*, *Amblyopia*, and *Progressive Nerve Atrophy* with hypodermic injections of strychnine, and says his results are in the main satisfactory. *In Night Blindness*, its internal use in small doses gradually increased may prove of service.

2130. *In Nervous Affections.* The *Essential Paralysis of Children*, and *Eccentric Palsy of Adults* are, according to Mr. Barwell, beneficially treated by hypodermic injections of strychnine. He advocates one-twentieth to one-twelfth of a grain, and he uses a 2 per cent. solution. Ringer says the injection should be made into the muscles every second day or even daily. It is useful also in *Paresis* following *Diphtheria*, *Scarlatina*, *Pressure upon Nerves*, &c.

2131. *In Chorea*, strychnine, on the authority of Trousseau, has been tried in many cases, in some with success. He dissolves gr. j. of the sulphate of strychnine in f℥iijss. of syrup; of this he administers f℥ijss. daily, divided into three doses, and gradually increases the dose until itching of the scalp and slight stiffness of the masseter muscles are observable. It is also advocated in some cases of *Epilepsy* when anæmia is present.

2132. *In Cardiac Neuralgia, including every variety of Angina Pectoris,—i.e.*, every case marked by attacks of sudden and spasmodic cardiac pain, evident embarrassment of the heart's movements, and a sense of impending dissolution—Dr. Anstie[1] speaks highly of hypodermic injections of strychnine in doses of gr. $\frac{1}{120}$—$\frac{1}{60}$. He mentions instances in which remarkable benefit attended its use, in presence of a threatening paroxysm; the remedy being continued twice daily for several weeks. Maragliano believes he has seen the *Dilated Heart* grow perceptibly smaller under its use, but he says the effect is transitory.

2133. *In all cases of Nervous Exhaustion, whether the result of mental harass or sexual excess, and also in the threatenings of Epilepsy, and of some forms of Apoplexy*, Dr. Marshall Hall[2] states that the acetate of strychnine is a remedy of great promise, and that he has seen benefit from its use. He advises the following formula:—℞ Strych.Acet. gr. j., Acid. Acet. Dil. ♏xx., Alcohol, ℥ij., Aq. ℥vj. M. Of this ten drops are to be taken as a dose. This should be combined with a rigid system of mental discipline, of diet, &c.

2134. *In Intermittent Fevers*, strychnine has been employed as a

[1] Brit. Med. Journ. Aug. 22, 1868. [2] On the Threatenings of Apoplexy, &c., p. 63.

substitute for quinine. Its powers were tested in the intermittents of the Lincolnshire fens by Mr. W. J. Marsh,[1] and his experience, he states, warrants him in asserting that the antiperiodic virtue of quinine is not superior to that of strychnine. He regards gr. $\frac{1}{40}$th (about ℥iij. of Liquor Strychninæ, B. Ph.) equal to gr. j. of sulphate of quinine. The value of strychnine in this class of cases is further shown by Dr. J. P. Nash,[2] of the Madras Army, in the fevers of Coorg, which quinine had failed to influence.

2135. *In Chronic Bronchitis and Emphysema of the Lungs*, small doses of strychnine or nux vomica with iron are well spoken of by Dr. Thorowgood,[3] especially when there is constant dyspnœa with prolonged expiration. Dr. Waters, however, does not think favourably of it in emphysema, and he mentions its failure in the practice of Dr. Walshe.

2136. *In Obtinate Constipation, Ileus, and Colica Pictonum*, strychnine has occasionally been found beneficial, but its use demands great caution, especially in acute cases.

2137. *In Atonic Conditions*, Dr. Lauder Brunton [4] regards strychnine as ranking very high indeed. By stimulating both the respiratory and cardiac centres it increases oxygen supply, and tissue metabolism and tissue renovation.

2138. *In the Night Sweating of Phthisis*, Dr. Brunton [5] has found strychnine very useful. It is also of service as a tonic in the same disease.

2139. *In Prurigo*, strychnine (gr. $\frac{1}{64}$–$\frac{1}{60}$ every three or four hours) is recommended. It should be continued till a decided effect is produced on the disease, or till nervous symptoms appear.

2140. Strychnos Nux Vomica, *Linn.* Nux Vomica, or Poison Nut Tree.

Med. Prop. and Action. The seeds (Nux Vomica, *off.*) and the bark (formerly known as the false Angustura bark) are powerful stimulants of the nervous system and spinal cord. Their activity resides in the alkaloids, strychnine, and brucine; of the former principle, the seeds yield about 0·4 per cent. In doses of gr. j.–iij. of the powdered nut, nux vomica is a tonic, improving the appetite and the tone of the digestive organs, without any increased arterial excitement, promoting the urinary secretion, occasionally acting as a laxative, and more rarely as a diaphoretic. In larger doses, it causes a feeling of weakness in the limbs, a slight trembling or stiffness of the muscles and joints, a staggering gait, much anxiety of mind, which is expressed in the countenance, increased nervous sensibility, and loss of appetite. It is also said to act as an aphrodisiac. The intellect remains unimpaired. Its effects in poisonous doses are the same as those of strychnine (*q.v.*). The smallest dose which has proved fatal is gr. iij. of the alcoholic extract, or gr. xxx. of the powder; the shortest period, one hour; the longest, three or four days. Recovery has taken place after very large doses of the poison (Dr. Guy, p. 556). Habit, however, (as in the case of opium, and other powerful medicines), blunts the sensibility, and allows of large quantities being taken with impunity. Mr. Baker,[6] a surgeon of the Bengal Service, states that the natives of Hindostan take Kuchila nut (nux vomica) morning and evening, continuously for many

[1] Med. Times, Jan. 12, 1869.
[2] Lancet, March 14, 1868.
[3] Lancet, Nov. 13, 1869.
[4] St. Barth.'s Hosp. Rep. vol. xv. p. 119.
[5] Practitioner, Aug. 1878.
[6] See Bengal Dispensatory, p. 439.

months, beginning with an eighth of a grain, and gradually increasing the dose to an entire nut, or about 20 grains. If taken immediately before or after meals, no unpleasant effect is produced; but if this precaution is neglected, spasms are apt to ensue.

Nux Vomica acts by virtue of the alkaloids, strychnine and brucine, which it contains. Strychnine is absorbed into the blood, where it has actually been detected by Masing. The convulsions excited by these alkaloids originate in the spinal cord, probably by acting directly upon the motor cells. Further, there is abundant experimental evidence to show that the motor nerves are depressed. It has been advanced by Kölliker that the nerve paralysis is due to nerve exhaustion, the result of excessive function, still Martin-Magron and Vulpian's results seem to negative this hypothesis. The same observers have found that strychnine in very large doses paralyses the efferent but not the afferent nerves.

Upon the circulation, Richter and Klapp found marked effects in strychnine poisoning. There is rise of arterial tension, occurring at the appearance of the convulsions. Mayer[1] believes this is due to vaso-motor spasm. He states that no increase in pressure occurs if hemisection of the cord is practised, and further, the same results are obtained in animals which have been curarised, and upon which artificial respiration is practised, It is stated also[2] that the frequency of the cardiac movements is lessened by strychnine, a result due in no way to the inhibitory nerves, the vagi being wholly unaffected. (See TABACUM.)

Dose:—*Of the Powdered Nux Vomica*, gr. j.–iij. (a bad form of administration). *Of the Extract*, gr. ss.–ij. *Of the Tincture*, ♏x.–xx.

Remarks on the use of Nux Vomica. (See STRYCHNINE.)

2141. *Therapeutic Uses.* *In Obstinate Chronic Diarrhœa* which resists ordinary remedies, and in that form especially which accompanies exhaustion after fevers, nux vomica combined with opium and iron often proves very useful. *In Chronic Dysentery*, when there is much exhaustion, a similar combination is well worthy of a trial.

2142. *In Chronic Dyspepsia*, Dr. Wilson Fox remarks that nux vomica or its alkaloid often proves most valuable, apparently improving the nervous energy of the stomach, as well as that of the system at large. Thus, in many cases, by increasing the muscular contractility of the stomach and intestines, it aids in preventing *distension by flatus*, which is so common and distressing a symptom. He advises ♏v.–x. of the tincture in infusion of orange-peel, or with the mineral acids. *In Pyrosis* and *Heartburn*, he also speaks favourably of it, and there can be no doubt that in these cases, as well as in *obstinate Flatulence*, it proves very useful; the tincture (♏v.–x.) may be given with hydrochloric acid, immediately before meals. Dr. Barlow furnishes a useful formula in those cases:—℞ Ext. Nucis Vom. gr. jss., Argent. Nit. gr. ij., Ext. Lupuli gr. xij. To be made into six pills and one of these to be taken three times a day.

2143. *In the Vomiting of Pregnancy*, the tincture is advocated by Dr. Wiltshire,[3] and Dr. Tilt (p. 326) states that in *Vomiting connected with Uterine Disease* he has used the following mixture with advantage:—℞ Strychninæ gr. ¼, T. Zingib. ʒvj., Aq. ʒiv.

[1] Med. Jahrb. d. k. k. Gesellsch, der Ærzte zu W. 1872.

[2] Carl Hemeniann, Virchow's Archiv, Bd. xxxiii. 394.

[3] Brit. Med. Journ. Aug. 22, 1868.

M. Dose, a teaspoonful every one or two hours. Dr. Douglas Powell[1] has also frequently found the tincture (♏x.) arrest the *Vomiting of Phthisis*, and in some cases, where there was little catarrh, he found strychnine efficient for this purpose. For the relief of *Vomiting connected with Malignant Disease of the Stomach*, Dr. Barlow advises the following pills:—℞ Ext. Nucis Vom. gr. j., Ext. Conii gr. xij. To make six pills, of which one is ordered three times a day.

2144. *In Obstinate or Habitual Constipation*, equally as in diarrhœa where this is dependent upon loss of nervous and muscular power of the intestines, nux vomica often proves signally useful. The extract may conveniently be blended with colocynth or rhubarb, and taken as a pill, or small doses (♏ij.–iij.) of the tincture taken before meals in water.

2145. *In Prolapsus of the Rectum*, Dr. Schwartz speaks highly of the extract of nux vomica. He dissolves gr. ij. in ʒij. of water, and of this administers gutt. ij.–iij. for infants, and gutt. vj.–xv. to older children, according to their age. Dr. Weber[2] corroborates, and states he finds it is greatly relieved by enemata containing strychnine, and also by hypodermic injections of the alkaloid.

2146. *In Incontinence of Urine*, it proves occasionally useful. M. Petrequin employed the tincture as a local application to the perineum. Dr. West speaks highly of it *in Incontinence of Urine*. Sir H. Thompson (p. 183) advises a trial with it where belladonna has failed. *In Spermatorrhœa and in Impotence*, it has also been found of occasional benefit.

2147. *Tremor of the Limbs produced by habitual Intoxication* is stated by Dr. Pereira to be much benefited by the use of nux vomica. Dr. Anstie speaks favourably of strychnine in this class of cases. He commences with gr. $\frac{1}{48}$, and gradually increases the dose to gr. $\frac{1}{32}$ thrice daily. Larger doses, he remarks, have invariably seemed to do decided harm, especially increasing the tendency to vertigo, visual hallucinations, and noises in the ears. *In some forms of Neuralgia*, especially in *Sciatica*, nux vomica has been used with occasional success. It is inadmissible in acute or inflammatory states.

2148. *Diabetes.* Some cases of *Diabetes Mellitus* are recorded[3] by Dr. Zarnana, who showed improvement under doses of gr. $\frac{3}{4}$ of alcoholic extract of nux vomica per diem in distilled water. This dose was subsequently increased to gr. $\frac{3}{4}$ every three hours.

2149. *Sexual Impotence*, arising from depression of the nervous system, has been usefully treated by nux vomica or its alkaloid strychnine.

2150. *Scrivener's Cramp* also is frequently greatly improved by the prolonged administration of nux vomica.

2151. *In Various forms of Vomiting*, in *Alcoholism*, and in persistent *forms of Vomiting*, Dujardin-Beaumetz has used it. Ringer says ♏x. of the tincture of nux vomica, or liq. strychninæ, will

[1] Practitioner, Nov. 1868.
[2] Med. Record, vol. xviii. p. 632.
[3] See Practitioner, vol. xxi. p. 51.

often check the *Vomiting of Pregnancy*, even when other remedies fail.

2152. In *Gastric Debility, with Gastralgia, Flatulence, Constipation*, and the feeling of general malaise associated with these symptoms, there are few, if any, remedies so serviceable as nux vomica or strychnine. And in general their use is indicated in conditions arising out of *Atonic states of the Bowels.*

2153. *In Chlorosis, Amenorrhœa*, and also in *Epilepsy following the disappearance of the Menstrual Discharge*, Dr. Copeland believes nux vomica is useful. Its employment demands extreme caution.

2154. STRYCHNOS TOXIFERA, *Bentham.* CURARE, WOORARI.

Med. Prop. and Action. Curare. Active principle curarine. Physiological action. Subcutaneous injections are much more efficient than when the drug enters through the alimentary canal. Paralysis of the entire motorial nervous system follows toxic doses—this seems to arise from the direct action upon the nerve end plates of muscle. The muscular tissue and afferent nerves are unaffected. Death occurs in warm-blooded animals through asphyxia. When artificial respiration is maintained, death finally occurs from heart paralysis.

The pupils become dilated, the sphincters relaxed. Curare increases the urinary secretion, and is rapidly eliminated. The urine is itself powerfully toxic.

The dose of curarine hypodermically is gr. $\frac{1}{200}$–$\frac{1}{100}$.

2155. *Therapeutic Uses. As an Antidote in Strychnine Poisoning*, &c. The employment of curare clinically has up to the present time been indifferently successful. It is important to remember that as various specimens differ as to their source they do not correspond in strength, and hence caution is needed in commencing the dose. It has been used in *Hydrophobia, Tetanus, Epilepsy* and *Chorea.* In the last-named disease it is useless. It is claimed that cases of each of the others have been cured. That curare controls the spasms of *Tetanus* and *Hydrophobia* is beyond question, but how far it is really effectual in promoting an actual cure has yet to be shown. The best mode of administration is to inject hypodermically gr. $\frac{1}{10}$ in aqueous (filtered) solution of the strength of 1 in 100.

2156. STYRAX PRÆPARATUS. Prepared Storax. A balsam obtained from the bark of Liquidambar orientalis, *Miller.*

Med. Prop. and Action.. Stimulant, expectorant, in doses of gr. v.-xx. in pill or emulsion. It exercises a powerful influence on mucous membranes, particularly on those of the respiratory and genito-urinary organs. Its use, in consequence of the cinnamic acid it contains, increases the quantity of hippuric acid in the urine. It is contra-indicated in all inflammatory states of the mucous membranes. It is an ingredient in T. Benzoini Co.

2157. *Therapeutic Use. In Chronic Bronchitis, Catarrh*, and *Asthma*, the compound storax pill occasionally proves useful. It was formerly held in high esteem, but is now rarely employed.

2158. *To indolent and ill-conditioned Ulcers*, storax has been applied locally with advantage, improving the character and quantity of the discharge, and apparently favouring the healing process.

2159. *In Leucorrhœa, Gonorrhœa, and some other Affections of the Mucous Membranes of the Genito-Urinary Organs,* storax in emulsion, with a sedative, may be given internally with advantage. The therapeutic uses are much the same as those of the Balsams of Tolu and Peru.

SULPHITES, ALKALINE. See SODII SULPHIS.

2160. SULPHUR. An elementary body existing extensively in the inorganic and organic compounds. Pharmacologically it is used as SULPHUR SUBLIMATUM. Sublimed Sulphur. SULPHUR PRÆCIPITATUM. Precipitated Sulphur. These varieties of Sulphur differ only in their various degrees of purity.

Med. Prop. and Action. Sulphur is diaphoretic and alterative in doses of gr. x.-xxx. In doses of gr. lx.-clxxx it is a mild and certain aperient, producing solid, soft stools, of a light yellow colour, and smelling strongly of sulphuretted hydrogen. Dr. Paris considers that its action as an aperient is limited to the muscular coat of the large intestines; but Sundelin, perhaps more correctly, considers that it operates specifically on the mucous membrane of the intestines. When taken internally it is absorbed into the system, and has been detected by Eberhard in the chyle, the lymphatics, and the vessels of the mesentery; a large portion of it passes off by the bowels, part is oxidized, and converted into sulphuric acid, which is eliminated by the kidneys; and another portion passes off by the skin in the form of sulphuretted hydrogen. Under the continued use of small doses, it stimulates the various secretions, particularly those of the skin and mucous membranes. Internally, when its aperient action is desired, it may be given with confection of senna, or with the acid tartrate of potash in solution; but when its diaphoretic and alterative effects are desired, it may be given alone in milk, or in conjunction with guaiacum, &c. Externally, it is applied in the form of simple ointment, or of a compound ointment (Sulphur ℥iv., White Hellebore Powdered ʒx., Powdered Nitrate of Potash, gr. xl., Soft Soap, ℥iv., Lard, lb. j.) The addition of Oil of Bergamot, ♏xxx., to either of these ointments, conceals the objectionable odour. The sulphur vapour-bath is also a valuable means for external application. The apparatus required consists of a wooden or bamboo frame, of a conical shape, covered with wax-cloth or some other impervious material; it should be large enough to enclose the whole body (when the patient is in a sitting posture), and an aperture, with a loose frill attached, so as to tie round the patient's throat, should be left at the apex. The sulphur is placed on a heated plate on the ground within the apparatus, and the body is exposed to the fumes for fifteen minutes, or longer. It proves highly serviceable in cutaneous, rheumatic, and some other diseases. Another mode of application of sulphur, introduced by Dr. Dewar, is by fumigation. For this purpose, a little flower of sulphur should from time to time be sprinked on a few red cinders placed in a kitchen shovel, so as to fill the room, not inconveniently, with the sulphurous fumes. Used in this manner, the vapour is thought to act as a prophylactic and disinfectant: its value in this character is strongly insisted upon by Dr. W. J. Cummins[1] and Mr. Startin.[2]

Dose:—Of Sublimed or Precipitated Sulphur, gr. xx.-lx. *Of the Confection*, ʒj.-ij. *Prep for external application, an Ointment. Sulphur Baths*, see POTASSA SULPHURATA.

2161. *Therapeutic Uses. Skin Diseases. In Scabies,* sulphur is the best remedy we possess when used with discretion; but it requires careful management. Dr. Tilbury Fox[3] furnished some

[1] Dublin Quart. Journ. Aug. 1869.
[2] Brit. Med. Journ. Jan. 21, 1871.
[3] Lancet, March 6, 1869.

very useful hints on its employment:—1. He considered the officinal ointment much too strong, and substituted a far weaker one (gr. xxx. ad Ung. j.) 2. In recent cases this should be smeared freely and thoroughly to the interdigits and wrists *only*, soothing remedies be applied to the general surface, when required to allay irritation. In chronic cases, however, it may be applied to all eruptions of a discrete character. 3. Sulphur baths and the old compound ointment should be discarded. 4. Before using sulphur, the parts should be well washed with soap. 5. The application should not be continued longer than necessary; many practitioners do so, being misled by the continuance of the itching, which they are apt to regard as the continuance of the disease, whereas it is sometimes the result of the action of the sulphur, itself an irritant, and which, if applied to the apparently sound though irritable skin of a scabious patient, is apt to induce an eczematous eruption. 6. Being satisfied that the remedy has produced its specific effect on the acarus, it is advisable to leave off the sulphur treatment, give a bran bath, use freely an oxide of zinc lotion, and the patient will soon get well. Dr. Fox preferred a three days' treatment of scabies, keeping on the same linen, and then having a thorough cleansing with soap and a clean change of clothes, to the more heroic and rapid modes of cure recommended by some. The great points to be borne in mind are, not to use too strong an ointment, not to apply it too extensively in recent cases, and not to continue its application too long. If these points be neglected, the remedy may act prejudicially.

2162. *In Acne, Eczema, Erythema, Impetigo, Favus, Pityriasis, Chloasma, and other Skin Diseases*, sulphur variously combined has been used, sometimes with success, as a local application. It is only admissible in chronic cases, where there is absence of inflammatory action. In the acute or active stage it does harm. When the diseases have become indolent and the skin needs to be stimulated, then sulphur is of use, and then only. (Dr. Tilbury Fox.) *In that form of Acne* (?) *common in young women at the menstrual period*, Dr. Ringer speaks highly of the following lotion, applied twice or thrice daily:—℞ Sulphur. ʒj., Glycerini fʒj., Aq. Oss. *In Tinea*, Sir Wm. Jenner's formula is said to be very effectual:—℞ Sulphur lb. ss., Hydrarg. Ammon.-Chlorid., Hydrarg. Sulphuret. āā ʒss., Ol. Olivæ ʒiv., Adipis ʒxvj., Creosote ♏xx. M. This should be well rubbed into the patches of tinea. *In Chronic Eczema*, sulphur and starch in powder dusted over the parts is occasionally useful in relieving irritation. *Pruritus Ani* is often relieved by sulphur taken internally.

2163. *Diseases of the Lungs. In Asthma*, M. Duclos advocates sulphur in doses of about gr. viij. daily to be given while fasting, and persevered in for a long period. *In Chronic Bronchitis*, Dr. Graves found benefit from a combination of sulphur and acid tartrate of potash. As a remedy for *Costiveness in Phthisis* he regards it as worthy of notice. See also Sulphurous Acid.

2164. *Diseases of the Abdominal Viscera. In Cholera*, Dr. J.

Grove,[1] who, after extensive experience, expresses himself strongly in its favour. He prescribes it thus:—Sulphur. Præcip., Sodii Bicarb. āā ʒiv., Spt. Lavand. Co. ʒxxiv., Aq. ʒlxxij. The soda and sulphur are to be first thoroughly triturated together in a mortar, the spirit of lavender to be gradually added till the whole is well mixed, when the water is added. Of this the dose is two teaspoonfuls in a little water, every two, three, or four hours, in simple choleraic diarrhœa; but if the case is urgent, every ten or fifteen minutes. In sudden or severe attacks, ℥x.–xxx. of T. Opii or Liq. Opii Sed. is added to the first dose. This "Cholera Mixture" seems worthy of further trial. As a prophylactic during epidemics, Dr. Blacklock, who originated this treatment, advises the sulphur internally, and a diet rich in sulphuretted ingredients.

2165. *In Hœmorrhoids and in Irritable States and Affections of the Rectum*, sulphur internally exercises a most soothing influence, more than can be fairly attributable to its aperient action. It should be taken with acid tartrate of potash, or confection of senna, in such doses as to produce one or two motions daily. *In Chronic Dysentery*, it seems also to exercise a favourable influence in some cases.

2166. *Other Diseases. In Chronic Rheumatism*, sulphur often proves useful. The nostrum commonly known as "The Chelsea Pensioner," appears to owe a great portion of its efficacy to the sulphur which it contains. It is thus formed:—℞ Flor. Sulphur. ʒij., Potassii Bitart. ʒj., Pulv. Guaiaci ʒj., Pulv. Rhei ʒij., Spirit. Nucis Myrist. fʒij. Mellis. q.s. Dose, ʒj.–ij. every morning and evening. Its use is restricted to muscular and neuralgic rheumatism; in the articular and periosteal form of the disease sulphur is of little, if any, benefit. *Rheumatic Headaches, and those which occur in women about the period of the Cessation of the Menses*, are often much benefited by the internal use of sulphur. Dr. Dewar strongly advocates sulphurous fumigation in *Gout and Rheumatism*. He likewise advises in these cases that the bed-clothes should be exposed to strong sulphur fumes before they are spread over the patient. By this measure, he states, copious perspiration is induced, and great relief afforded.

2167. *In Sciatica*, Dr. Fuller speaks highly of the external use of sulphur. He sprinkles a piece of new flannel thickly with precipitated sulphur, and in this the whole limb is encased from the foot upwards and covered with oil-silk or gutta percha, which has the effect not only of increasing the warmth and confining the vapour of the sulphur, but of obviating the odour annoying the patient. It should be kept applied night and day. Absorption takes place rapidly, and the breath, urine, stools, and perspiration unmistakably attest its presence in the system. This, perhaps, explains its *modus operandi:* be that as it may, Dr. Fuller states that nothing proves more generally efficacious. It is well worthy of a trial in every case, when all active symptoms have been subdued or are absent.

[1] On Epidemic Cholera in 1865.

2168. *In Scrofula*, Mr. Bulley[1] advises the internal use of sulphur. The following is the formula which he recommends:—℞ Sulph. Pur. gr. v.–x., Syr. f℥j., Aq. ℥vij.; to be taken once or twice daily, in a tumblerful of milk. The employment of sulphur in the treatment of scrofula is not of modern origin; it was formerly held in high esteem, but has fallen into disuse.

2169. *In Paralysis of an Asthenic or Chronic Character*, Dr. Graves places much confidence in sulphur. He commences with strychnine in small doses, and continues its use until some sensible effect on the system is produced; he then omits its administration, and has recourse to sulphur. He adds that he has seen very good effects from a perseverance in the use of the sulphur electuary, and that much good will be accomplished by the external use of sulphur in the form of baths. *In Mercurial Palsy*, Dr. Lettsom regarded it almost as a specific. *In Locomotor Ataxy*, sulphur baths, according to Dr. Althaus,[2] will do much as adjuncts to other remedies in relieving the pain and diminishing the numbness. *In Chorea*, sulphur baths have, in some instances, been found of great value as adjuncts to internal remedies.

2170. *In Colica Pictonum and other forms of Lead Poisoning*, sulphur baths are of essential service, conjoined with the internal use of sulphuric acid (*q.v.*) *In Mercurial Salivation*, sulphur internally has been well spoken of, but it is less effectual than iodide of potassium.

2171. *In Diphtheria*, insufflation of sublimed sulphur had apparently a marked effect in arresting the development of the false membranes, and in aiding a cure, in the hands of M. Barbosa. It is recommended that the unwashed flower of sulphur should be applied, by means of a simple tube slightly bent, directly to the affected surfaces.[3]

2172. *Onanism not infrequently arises from Hœmorrhoidal Congestion:* under such circumstances, Van der Kolk has found benefit from the internal use of sulphur; leeches to the anus or perinæum, cold washings, sitz-baths, and a spare diet, are at the same time to be employed. He mentions an obstinate case cured by these means. He advises the sulphur not to be given at night, as he has observed in some cases it causes sleeplessness. In the early stages of onanism he has found dilute sulphuric acid act well. *In Nymphomania*, depending on the same cause, not apparently an infrequent one, this simple treatment is deserving of trial.

2173. In cases of *Granular Conjunctiva*, Mr. Wharton Jones has used sulphur ointment as a local application with very good effects in several instances. It is applied much in the same manner as the red precipitate ointment.

2174. Sulphuris Iodidum. Iodide of Sulphur.

Med. Prop. and Action. Similar to those of iodine. It is used externally in the form of ointment.

Dose, gr. ss. gradually increased to gr. v. daily, in the form of pill.

[1] Med. Times, vol. xviii. p. 53.
[2] Lancet, Dec. 30, 1865.
[3] Practitioner, Nov. 1868.

2175. *Therapeutic Uses.* *In Cutaneous Diseases,* particularly those of a squamous and tubercular character, the iodide, externally applied, is strongly recommended by Alibert, Biett, and Rayer; Dr. Escolar, of Madrid, also employed it internally, in doses of gr. j.–vj., with great advantage. *In Acne indurata and Rosacea,* it is advised by Dr. Todd; *in Prurigo senilis, Lepra, and Psoriasis,* by Dr. Davidson; and it has been found very effectual also in *Favus confertus, Lupus, Tinea capitis, Chronic Eczema, Lichen, Alopecia,* &c. Dr. D. Donovan records three cases of *Porrigo favosa* (*Scald-head*) cured by the iodide ointment (gr. lx. ad Ung. ℥jss. Its application is attended with some heat and pain, and if applied to large surfaces it sometimes produces erysipelas. *In Sycosis,* the ointment (*ante*) is advised by Sir E. Wilson.

2176. Sulphuric Acid. Acidum Sulphuricum. Diluted Sulphuric Acid. Acidum Sulphuricum Dilutum. Aromatic Sulphuric Acid. Acidum Sulphuricum Aromaticum.

Med. Prop. and Action. The strong acid is a powerful escharotic; the parts touched with it first become white, but subsequently brownish-black. It is too corrosive for internal use. The diluted acid is refrigerant, astringent, and tonic, in doses of ♏v.–xx. properly diluted. It is used as a refrigerant in fevers, as an astringent to check hæmorrhage and passive mucous discharges, and as a general tonic to improve digestion. Given to women who are suckling, it is apt to cause colic in the child. It renders the urine acid, and proves useful in cases of phosphatic deposit. Being injurious to the teeth, it should be sucked through a quill or glass tube, and the mouth carefully washed with an alkaline solution after each dose. The aromatic acid is a very useful and agreeable tonic.

Dose:—Of the Diluted or Aromatic Acid, ♏v.–xxx., freely diluted.

2177. *Therapeutic Uses.* *In Colica Pictonum, and Poisoning by Lead generally,* sulphuric acid is stated by M. Gendrin[1] to act both as a prophylactic and as a remedial agent. This opinion has been ably supported by Dr. H. Bennet. As a pupil of M. Gendrin, he saw in Paris a large number of cases of saturnine poisoning; and he states that, with the exception of one or two cases of chronic lead palsy, he does not remember one which proved refractory to the treatment adopted. Mild cases yielded generally in about three days, severe ones in six or seven. The treatment consisted in the administration of sulphuric acid, largely diluted with water (gutt. xliv. ad Aq. Oj.), of which Oij.–Oiij. were given daily. Sometimes the first dose or two was rejected; but it was persevered in, and the stomach soon became accustomed to it. When it was retained, the abdominal pains generally began to diminish after the first or second day, the constipation gradually giving way when the pains had become less intense. No other medicine of any kind was administered; but it was considered a point of the greatest importance to combine its use with repeated sulphur baths. The observations of Tanquerel and of Grisolle stand opposed to the alleged prophylactic powers of sulphuric acid in these cases; indeed, they rather

[1] Lancet, April 4, 1846.

tend to show that the workmen in lead who use sulphuric acid drinks are sooner attacked than those who abstain from them. (Stillé, i. p. 283).

2178. *In Hæmorrhage,* diluted sulphuric acid, although less certain in its action than the acetate of lead, gallic acid, and other remedies, is a very useful adjunct to other treatment. Dr. W. Fraser states that *in passive Hæmorrhage from the Lungs, Bowels, and Uterus,* he frequently combines it in solution with gallic acid. *In Hæmatemesis,* it proves more useful than in the other forms, probably from the fact of its coming in contact with the bleeding surface *In Uterine Hæmorrhage,* it has long been extensively prescribed in combination with tincture of opium and infusion of roses.

2179. *In Calculous Affections, and when the urine is of an alkaline character,* sulphuric acid has in many cases proved successful in correcting the alkalescence, but it is generally inferior in efficacy to nitro-hydrochloric acid. Dose, ℥xv.–xxx., three or four times daily.

2180. *In Choleraic Diarrhœa and Summer Diarrhœa,* diluted sulphuric acid in full doses (℥xx.–xxx.), with or without a few drops of laudanum, is often effectual in arresting the discharge. In severe cases, this may be repeated every hour or oftener; in milder cases, every three or four hours. When the diarrhœa evidently arises from the use of crude, indigestible food, a dose of castor oil should precede the use of the acid. The following draught, in use in the London Hospital, has been found beneficial :—℞ Acid. Sulph. Aromat. ℥xx., T. Camph. Co. ʒj., Spt. Choroformi ℥x., Spt. Menth. Pip. ʒss. Syr. Rhœad. ʒj., Decoct. Hæmatox. fʒj. M. To be repeated every four or six hours, according to the urgency of the case. *In Simple Infantile Diarrhœa,* it has also been recommended. Dr. West states that he has given ℥iv. of the dilute acid in Aq. Carui every four hours, and though successful in some instances, it is less uniformly effectual than the rhubarb mixture (*q.v.*) The only cases in which it seemed to possess a decided superiority over that remedy were those which were attended with frequent vomiting and great irritability of stomach. *In Puerperal Diarrhœa depending upon intestinal irritation,* Sir C. Locock states that the diluted sulphuric acid, with a few drops of laudanum, sometimes effectually restrains the diarrhœa, and improves the character of the tongue, particularly if there are aphthous ulcerations. *In the Diarrhœa of Typhoid Fever,* Dr. H. Kennedy states, after ample experience, that by far the best remedy is dilute sulphuric acid (fʒj.–iij. ad Aq. fʒviij.). It is best to begin with a small dose and increase it as required; the diarrhœa should not be too suddenly checked. Opiate enemas to allay tenesmus are to be used.

2181. *In the profuse Perspirations of Phthisis,* no remedy, according to Sir R. Christison, equals diluted sulphuric acid. There can be no doubt of its utility in many cases, and it also serves occasionally to arrest the *Diarrhœa* so troublesome in the latter stages. Dr. Graves advises its combination with henbane.

2182. *In the advanced stages of Typhus and Typhoid Fever*, sulphuric, in common with the other mineral acids, is often of great service. Doses of ♏xv.–xx.., with gr. j. of quinine, may advantageously be given every three or four hours, together with stimulants and nutritives. It is especially useful when diarrhœa is present. *In Confluent Smallpox*, a similar mode of treatment offers the best prospect of success.

2183. *In Scarlatina*, diluted sulphuric acid, with the addition of a little syrup and water, forms an excellent refrigerant medicine, particularly for children. *For the Sore Throat* which accompanies this disease, and also for *Cynanche Tonsillaris*, the infusion of roses, acidulated with sulphuric acid, forms an eligible gargle. The mouth should always be well washed out after its use.

2184. *In Syphilitic Eruptions of the Skin*, Dr. Schedel states that he has seen the best effects produced by its internal administration; and Dr. Fricke states that sulphuric acid baths (f℥ij. of the strong acid to each bath) exert a favourable influence. *In Mercurial Ptyalism*, Mr. Pearson found great benefit from this acid, given internally and used as a gargle, in conjunction with decoction of cinchona.

2185. *In some Cutaneous Diseases*, the internal use of this acid proves highly beneficial. *In Pruritus*, it has been used with good effects. *In Eczema, Scabies, Tinea capitis*, &c., an ointment composed of f℥j. of the acid and ℥j. of lard proves highly useful. *In Ephelis*, the diluted acid (℥j. ad Aq. ℥viij.) is advised as a lotion by Bateman.

2186. *In the Bites of Rabid Animals*, Dr. W. Frazer considers that the strong acid is the best caustic that can be employed.

2186*. *In Paralysis, Chronic Rheumatism, Chronic Affections of the Joints*, great benefit is stated to have resulted from the persevering use of the sulphuric acid ointment (acid f℥j., lard ℥j.); its action is that of a powerful irritant.

2187. Sulphurous Acid. Acidum Sulphurosum.

Med. Prop. and Action. Disinfectant and antiseptic; its action, whether given internally or applied externally, depending apparently on its power of destroying the parasitic vegetable growths which infest the human body. The so-called "Sulphur-cure," brought so prominently forward by Dr. Dewar, consists mainly in the varied application of sulphurous acid. He applies it in three ways:—1. In solution (equal parts of the acid B. Ph. and of water or glycerine). 2. By fumigation: for this purpose a few drops of the acid may be added to boiling water and the fumes inhaled, or a small portion of sulphur may be sprinkled from time to time on a few red-hot cinders, so as to fill the room not inconveniently with the fumes. 3. In spray, by means of a vaporizer. For children, the instrument should be held about three feet from the mouth, and the fine spray produced should be inhaled. This may be repeated according to circumstances; in acute cases every hour or oftener. For adults it is advisable "to hold the nozzle of the instrument about six inches from the patient's mouth, and administer three or four whiffs to begin with; then, after a corresponding interval, during which a cough or two is given, the process is repeated; about twenty squeezes in all, which represents the injection of

mxl.-lx. of the acid." Great stress is laid on the acid being pure, otherwise it may give rise to much irritation and annoyance.

Dose:—Of Sulphurous Acid, mxxx.-lx., largely diluted.

2188. *Therapeutic Uses. Diseases of the Lungs, Throat, and Air-passages.* Dr. Adams,[1] of Glasgow, who has examined the claims of this treatment, states that in *Catarrh, Acute Bronchitis and Chronic Cough*, it stimulates the exhalant vessels, and that under its use the tough viscid phlegm which collects in the bronchi is dislodged more freely and effectually than under the use of ordinary expectorants, but he doubts its advantage over chlorine or vinegar inhalations. *In Asthma*, however, he found in some cases it was not tolerated, and in others its effects were *nil. Individuals subjected to repeated Catarrhs*, otherwise in good health, seemed really benefited by its use. Cases of inflammatory sore throat were not benefited, but in *Hoarseness following the acute stage*, he states that he has seen improvement and relief from it. *In Phthisis*, Dr. C. J. B. Williams[2] states that the use of sulphurous spray in his practice is limited, and not very encouraging; but he adds that he has found it a most useful and agreeable remedy *in Affections of the Throat, whether Diphtheritic or Aphthous*, and that it has proved cleansing and soothing in some cases of foul ulcerations of the throat affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption. Dr. Purdon[3] relates a case of *Syphilitic Ulceration of the Throat* which yielded to sulphurous acid applied in the form of spray, after other ordinary means had failed.

2189. *Typhoid Fever* is another disease in which "the sulphur-cure" is lauded by Dr. Dewar. It is highly spoken of by Dr. R. Hamilton;[4] but the strongest evidence in its favour has been adduced by Dr. G. Wilks,[5] who claims for it a real antidotal power. He gives mijss. to mxx., according to age, every four hours, and continues its use for a week, ten days, or more until the patient complains of tasting, smelling, or feeling like sulphur or lucifer matches; or, in the case of infants, until they actually emit an odour of the gas from the skin and breath; this being taken as evidence that the system is saturated with the remedy it is stopped. Where diarrhœa is present he adds sulphuric acid and laudanum. His usual formulæ are as follows:—*For Adults:* ℞ Acid. Sulphurosi ʒij., Syr. Aurant., ʒiij. Aq. ad ʒvj. M.: or Acid. Sulphurosi ʒij. Acid. Sulphuric. Dil. ʒij., T. Opii mxx., Syr. Aurant. ʒiij., Aq. ad ʒvj. M. *For Infants:* ℞ Acid. Sulphurosi mxv., Syr. Aurant. ʒiij., Aq. ad ʒj.; or ℞ Acid. Sulphurosi mxv., Acid. Sulphuric. Dil. mxv., T. Opii mij., Syr. Aurant. ʒiv., Aq. ad ʒj. M. A sixth part of either of these mixtures to be taken every four hours. The great success which appears to have attended the use of these remedies in Dr. Wilks's practice fully justifies further trials with

[1] Glasgow Med. Journ. March 1868.
[2] Lancet, Aug. 15, 1868.
[3] Brit. Med. Journ. May 9, 1868.
[4] Practitioner, Feb. 1869.
[5] Brit. Med. Journ. Dec. 3, 1870.

it. It is in this class of cases that Dr. Cummins[1] thinks so highly of sulphurous acid fumes (generated by burning sulphur as a prophylactic.)

2190. *In Sarcinæ Ventriculi*, sulphurous acid, from its power of destroying the lower forms of organic life, has been employed sometimes with success. Dr. Russell Reynolds recommends[2] the acid, prepared in the ordinary way, to be passed through water till the latter has absorbed as much as it will take up. This saturated solution is to be diluted until the fluid is no longer disagreeable to take, when f℥j. should be taken before each meal. The sarcinæ may thus be destroyed, but they are apt to return, until the conditions on which their presence depends have been removed. Dr. Drysdale[3] records an obstinate case of constant *Vomiting and Eructations* which yielded at once and permanently to sulphurous acid (♏xxx.) thrice daily. *In Pyrosis*, Dr. Lawson[4] obtained the best effects from this acid in doses of ♏xxx.–f℥j. thrice daily, shortly before meals. Bitter infusions may be employed, but plain distilled water is the best vehicle. *In Aphthæ* and *Aphthous Ulceration of the Mouth*, the diluted acid has been well spoken of as a wash or gargle.

2191. *In Skin Diseases of vegetable parasitic origin*, sulphurous acid, with equal parts of glycerine, is an efficient application; or, diluted with two or three parts of water, it may be applied on a piece of lint to the affected part, and covered with oiled silk so as to prevent evaporation. This treatment, first introduced by Sir W. Jenner, has proved successful in various forms of *Tinea, T. tonsurans, T. decalvans, T. favosa, T. sycosa* (*Sycosis*), *Chloasma, Pityriasis versicolor, &c.* It will often succeed when all other remedies fail. *In Erysipelas*, according to Dr. Dewar, the application of sulphurous acid and glycerine (equal parts) relieves the burning and arrests the spread of the inflammation.

2192. Amongst the other affections which yield, according to Dr. Dewar, to the acid either by solution or fumigation, are *Chilblains, Sore Nipples, Chapped Hands, Bruises, Ulcers, and Wounds*, whether surgical or accidental. In the latter he regards it as superior in efficiency to carbolic acid.

2193. Sumbul Radix. Sumbul Root. The dried root of Ferula Sumbul, *Hooker*.

Med. Prop. and Action. From its physical characters and physiological effects it appears to rank amongst the nervine stimulants, approximating probably more nearly to valerian than any other drug. It has been recommended in a great variety of diseases, but probably its real benefit is only revealed when sumbul is used in *Nervous Diseases*. In *Migraine*, especially in the neurotic, it is useful. In *Hysteria* and the obscure *Paralytic Affections* associated with it sumbul deserves a trial.

Dose:—Of Sumbul Root, in powder, gr. x.–xx. *Of the Tincture*, ♏x.–xxx.

[1] Dublin Quart. Journ. Aug. 1869.
[2] Med. Times, July 27, 1867.
[3] Lancet, July 24, 1869.
[4] Practitioner, Sept. 1868.

2194. Tabaci Folia. Leaf Tobacco. The dried leaves of Virginian Tobacco, Nicotiana Tabacum, *Linn.*

Med. Prop. and Action. Sedative and antispasmodic; also purgative, emetic, and diuretic in a minor degree. When locally applied, it appears to be stimulant; thus, when it is used in the form of snuff, it causes violent sneezing, and when chewed, greatly increases the flow of saliva. When taken in small doses, by those unaccustomed to its use, it causes nausea, vomiting, vertigo, and a great depression of the vital powers; in larger doses, these symptoms increase in intensity; there is great prostration; a low, weak, trembling pulse; cold, clammy perspiration, obscurity of vision, and a tendency to faint. In extreme cases, convulsions, paralysis, and coma precede death. These symptoms evidence themselves whether tobacco has been taken by mouth, or in the form of enema, or even in some cases when the leaves have been applied to a large abraded surface. In its operation and effects it is closely allied to digitalis. Its activity depends upon a liquid alkaloid, *Nicotine*, and upon a concrete volatile oil, *Nicotianin*. Nicotine is an energetic poison, almost equalling hydrocyanic acid in potency. Nicotianin also possesses poisonous properties. The effects of tobacco may thus be epitomized. A burning sensation affecting the alimentary canal, while the nervous system is profoundly affected. Tremulousness of the muscles deepens into complete paralysis. There is drowsiness, lethargy, followed by unconsciousness. The pulse weakens, and the heart grows irregular in its action; the surface is pallid, the blood shows increase of the red discs, which are, however, irregular and misshapen. The respirations become shallow and incomplete. The patient passes into a condition of profound collapse, and dies from paralysis of his respiratory muscles or his heart. Partial or complete amblyopia occurs alike in chronic and acute nicotine poisoning. Tobacco is a remedy which should be used with great caution, as it causes such perfect prostration that the vital powers have not sufficient strength left to recover themselves, and a fatal termination follows. Fatal results from tobacco enemas are recorded. Gr. xv. (Stillé and Maish) of the leaves in infusion is the smallest quantity which has proved fatal. Smoking tobacco and snuff-taking, when first commenced, cause nausea, vomiting, &c. Their moderate use does not appear to be injurious, but excessive indulgence in them induces dyspepsia and a cachectic state of the body. From its powerfully depressing action it is very objectionable as an internal remedy.

2195. *Therapeutic Uses. In Spasmodic Asthma,* smoking tobacco occasionally affords relief. As the most conflicting results follow its use, experience in each individual case is the sole test of its utility. Asthmatic patients should avoid the habitual use of tobacco, otherwise tolerance is effected. For ladies and children a few whiffs of a mild cigarette are quite sufficient. *For the relief of the Asthmatic symptoms occurring in Emphysema,* Dr. Waters speaks favourably of tobacco-smoking in those not habituated to it, but he does not think its influence as lasting as that of Stramonium.

2196. *In Hay Asthma,* tobacco pushed *ad nauseam* gives much relief, but there are better and safer remedies.

2197. *In Tetanus,* tobacco enemas have been advised and successfully employed, and Bartholow regards it as the most reliable mode of treatment in these cases. Its use is, however, not free from danger, and hence needs the utmost caution. When employed, the strength should never exceed gr. xxx. of the leaves in Oss. of water; and great care is necessary to prevent too great an amount of depression by the administration of ammonia, brandy, and

other stimulants. Cases of tetanus recovered under the use of nicotine are recorded by Mr. Tuffnell, and Mr. R. Harrison. Prof. Haughton, of Dublin, has also recorded two cases of traumatic and one of idiopathic tetanus treated by nicotine. He gave minim doses of the alkaloid every two hours. Two of these cases recovered. As a general rule, physostigma offers a better chance of recovery.

2198. *In Strychnine Poisoning*, tobacco has been employed with the view of controlling the spasms. Dr. O'Reilly has recorded a case successfully treated by it. He prescribed it internally in infusion; the total quantity taken in divided doses during twelve hours, was one ounce and two drachms. Nicotine may be given hypodermically according to the formula of Erlenmeyer:[1] Nicotine gr. ss., Water ʒij.

2199. *In Rheumatic Pains of the Joints and Bones, in Gout, and in painful Nodes and Sprains*, the application of a moistened tobacco leaf often affords great relief; I have repeatedly witnessed its efficacy. Dr. Fuller recommends it in *Rheumatic Gout;* the moistened leaf should be kept *in situ*, and covered with oiled silk or thin gutta percha.

2200. *Hæmorrhage from Leech-bites*, &c., may sometimes be arrested by applying a piece of tobacco leaf over the bleeding surface.

2201. Amongst other diseases in which tobacco has been employed are *Dropsical Affections*, *Ileus*, *Colica Pictonum*, *Dysentery*, *Peritonitis*, but in all these it has been superseded by safer and more efficient remedies. Tobacco fomentations have also been employed in the cure of *Scabies*, and *Tinea Capitis*, but they are inferior in efficacy and safety to many other means. They are useful in *destroying pediculi*, but care is required in their employment.

2202. Tannic Acid. Acidum Tannicum. Tannin.

Med. Prop. and Action. Powerful astringent, in doses of gr. ij.–iij. twice a day, in chronic cases; gr. v.–xx. in urgent cases, such as acute hæmorrhage. Tannic acid is said to become transformed into gallic acid in the circulation, but there is some doubt about the accuracy of this statement. It coagulates albumen and mucus, and although often producing little or no digestive derangement, repeated doses may cause rectal tenesmus, dry-coated tongue, thirst and dyspepsia.

Dose:— Of Tannic Acid, gr. ij.-x. The B. Ph. contains *Tannic Acid Suppositories*, each containing gr. ij., and *Lozenges* each containing gr. ss of the acid; also for external or local use, *Glycerine of Tannic Acid*, a very useful astringent application.

2203. *Therapeutic Uses. In passive and exhausting Hæmorrhage, whether proceeding from the lungs, the stomach, the uterus, or the kidneys*, tannin, internally administered in doses of gr. iij.–vj., three or four times a day, proves useful by its astringent and tonic properties. The sole contra-indication of its use is the presence of acute or inflammatory symptoms. In superficial

[1] See Subcutanen Injectionen der Artznermittell.

Hæmorrhage, as from the gums, Hæmorrhoids, &c., tannin, in fine powder dusted over the bleeding surface, proves an efficient styptic. *In Hæmaturia*, Dr. O. Rees states that it is the best astringent he knows when given in the form of pill. *In Hæmoptysis, in the Hæmorrhage of Dysentery, and in threatened Abortion* it is strongly advised by Dr. Cummins to be given in combination with opium and ipecacuanha. *In Epistaxis*, tannin, finely powdered, is to be blown through a quill into the nostrils.

2204. *In Chronic Bronchial Catarrh*, occurring in weakly and elderly persons, unconnected with disease of the heart or great blood-vessels, and attended with copious and debilitating expectoration, the internal administration of tannin, in doses of gr. j.–ij.–iij., twice or thrice daily, has greatly and gradually abated the secretion, relieved the frequent cough, and improved the strength.

2205. *In Phthisis*, when softening has taken place, tannin has been thought useful in restraining weakening discharges. Dr. Ringer[1] has found the *Cough of Phthisis* allayed by the application of the glycerine of tannin to the throat; and he adds that a good night's rest may often be obtained by applying it just before going to sleep. The addition of a small quantity of morphine greatly increases its efficacy.

2206. *In the Chronic stage of Hooping Cough*, tannin is recommended by M. Sebregondi.[2] He administered it every two hours, in gr. $\frac{1}{4}$ doses, in conjunction with a sedative, as conium, or with a purgative, as infusion of senna. Under this treatment the paroxysms entirely ceased. Dr. Durr advises its combination with equal parts of benzoin and fifty parts of sugar; he found it very efficacious. Dr. Ringer speaks highly, in these cases, of the local application of the glycerine of tannin to the pharynx; it should be carried low down, and be brought in contact with the neighbouring parts. It is only beneficial in uncomplicated cases, in the absence of inflammatory symptoms.

2207. *In many Throat Affections*, the glycerine of tannin is an extremely useful application. *On the subsidence of Acute Inflammation*, as the mucous membrane becomes less red and swollen, and more moist, and is covered with mucus or pus, it tends to hasten the restoration of the parts to their normal state. *Superficial Ulceration*, under the same circumstances, may also be speedily healed by its application. *Chronic Inflammation of the Throat*, also, is greatly benefited by it, and it serves in a marked manner to remove that frequent hacking *Cough* which depends upon a relaxed condition of the mucous membrane of the throat. Such a state of the throat also frequently causes slight *Deafness*, especially in children, and this may be removed, with the chronic inflammation of the pharynx, by the employment of this agent. (Dr. Ringer.) Dr. L. Sedgwick has employed it with great advantage in "*Clergyman's Sore Throat.*" Dr. Hillier advises a

[1] Practitioner, July 1868.
[2] Med. Zeitung, No. 1.
[3] Practitioner, Oct. 1868.

tannin gargle, or wash, for removing a *Relaxed state of the Throat and Tonsils following Scarlet Fever.*

2208. *In Croup and Diphtheria,* the inhalation of a solution of tannin (gr. ij.–x., ad Aq. ℥j.), applied for fifteen or twenty minutes, by means of an atomizer, has been successfully employed by Barthez and Trousseau. After several repetitions, large pieces of false membrane were rejected, and the breathing was relieved. (Dr. Beigel.)

2209. *In Chronic Diarrhœa,* which has resisted all ordinary treatment, and which is not dependent on obstructive disease of the heart or liver, tannin has proved, according to the experience of Dr. Alison, of surprising efficacy. In severe cases depending on an irritable weakly mucous membrane, he states that he has not known one failure; and of those examples connected with chronic inflammation and disorganization of the mucous membrane, only two proved beyond the influence of the remedy. It should be given with opium in the form of pill.

2210. *Diseases of the Genito-Urinary Organs. In Atonic Leucorrhœa,* Dr. Alison found tannin efficacious in restraining the discharge, and restoring the tone of the system. He prescribes an aqueous solution, combined with a small portion of dilute nitric acid. Dose, gr. ij.–iij., twice or thrice daily.

2211. *In Prolapsus Ani,* Dr. Alison speaks favourably of the injection of an aqueous solution of tannin. It is particularly indicated when there is much relaxation of the parts. Reduced to a fine powder and mixed with lard, it is advised as an application to *Hæmorrhoidal Tumours,* when free from inflammation. *In Fissure of the Anus,* Dr. Van Holsbek has used the following with great advantage:—℞ Tannin ℥j., Glycerini f℥xvj. M. Introduced on a tent, night and morning.

2212. *In Gonorrhœa and Gleet,* tannin is a valuable local application. Injections of an aqueous solution (gr. ij., Aq. ℥j.), repeated every hour, were found by Mr. Bryant to effect not unfrequently a rapid cure. He also speaks favourably of a concentrated solution of tannin in glycerine introduced into the urethra on a bougie at short intervals. For a good method of preparing these bougies, see next section. Dr. Ringer (p. 223) and Mr. J. D. Hill[1] report very favourably of injections of the glycerine of tannin; but, as a solution of the officinal strength is apt to give rise to much pain, should be diluted thus:—Glycerine of Tannin f℥iij., Olive Oil ℥j., Mucilage f℥j. M. Mr. Hill furnishes particular directions for the use of this injection; he recommends the fluid to be retained in the urethra for four or five minutes, so as to insure its thorough application, and the permeation of the tissues.

2213. *Urethritis in the Female.* The use of bougies covered with tannin is, according to Dr. Braxton Hicks,[2] one of the most efficient modes of treatment. The best plan, he remarks, is to cover a medium-sized gum elastic bougie with gum water, and then to dip it into powdered tannic acid. The superfluous quantity is then

[1] Lancet, March 20, 1869. [2] Lancet, Oct. 12, 1867.

shaken off, and the film allowed to dry. Before using it, it should be gently passed through the fingers to remove any roughness which may be present, then dipped into gum water, and passed into the urethra, and left there for ten or fifteen minutes. This may be repeated once a week. There is generally but slight irritation; perhaps the next day some small increase: by three or four days the irritation will have much subsided, and then two or three applications at intervals of a week are sufficient to complete the cure. *Chronic Vaginitis, whether of adults or children*, is often manifestly benefited by the local application of the glycerine of tannin.

2214. *For Nasal Polypus*, Mr. T. Bryant[1] advocated the employment of finely powdered tannin as snuff. It should be blown daily into the nostrils through a quill. He also speaks of the glycerine of tannin as one of the best applications for a *Chronically Swollen and Thickened condition of the Nasal and Palatal Mucous Membrane*. The glycerine of tannin is a very useful application in *Ozæna* and *Otorrhœa*, especially when occurring in children.

2215. *In Dyspepsia*, tannin proves very efficacious. The symptoms disappear under its use, the appetite increases, flatus and the sense of distension abate at the same time; and it has been found, in several instances, that the bowels, far from becoming constipated, acquired a more healthy tone, and actually became more free. It may be advantageously combined with dilute nitric acid.

2216. *In Mercurial Salivation*, tannin is a valuable local application. Sir T. Watson found that pure tannin, moistened and smeared upon the spongy gums, is remarkably efficacious in rendering them firmer and more comfortable. *In Idiopathic Hæmorrhage and Sponginess of the Gums*, it also proves most useful. *In Toothache*, Dr. Druitt states that tannin is the most effectual of all remedies; thus—℞ Tannin gr. xx., Gum Mastich. gr. x., Spt. Æther. Sulph. fʒss. M. It is particularly serviceable if the gum be flabby, or in case a bit of the gum grows in the cavity of a carious tooth.

2217. *In Anasarca accompanied with Albuminuria*, Dr. Garnier considers that he derived great benefit from tannin in daily doses of gr. xxx.–lx.

2218. *To Sore Nipples*, a solution of tannin (gr. v., Aq. ʒj.) is a useful application. Mr. J. Martin[3] advocates the use of a saturated solution of tannin (gr. 600, Water ʒj.) as a preventive of *Bed Sores*. To be effectual, he regards as essential—*a*, that the tannin be perfectly fresh; *b*, that *cold water* be employed; and *c*, that the solution be quite recent. The theory of its action is that it combines chemically with the gelatine of the skin, forming a contracted impermeable layer of tannate of gelatine; in short, tanning or converting into leather the superficial layer of the cuticle. It may be applied by a layer of lint saturated with the solution, or by means of a brush. Mr. Martin advises this saturated solution in *Cutaneous Affections depending upon a local cause*, as the layer

[1] Lancet, Feb. 23, 1867.
[2] Archiv. Gén. de Méd. Jan. 1859.
[3] Brit. Med. Journ. March 20, 1869.

which it forms peels off after a short time, removing, when they exist, such parasites as *Pulex Penetrans* (*Chigres*), *Acarus Scabiei*, *Entozoon Folliculorum*, *&c.*

2219. *In Diseases of the Eye*, a strong solution of tannin (one part of tannin and three of water) is a good local application. It has proved successful in *Acute and Chronic Conjunctivitis, vegetating Granulations, Corneitis with or without Ulceration, Chemosis, and especially in Pannus.* One part of tannin to twenty, thirty, or fifty parts of water is a sufficient strength for ordinary cases; thus diluted, it is a valuable astringent collyrium, and is much employed in modern practice. It has been employed with great success in *Phlyctenular Ophthalmia, Acute and Chronic Granular Conjunctivitis, Pannus, &c.* It may be used in the form of spray or fine dust by means of a small india-rubber ball.

2220. *To some obstinate Skin Diseases, and to Ulcers with copious discharge*, the application of tannin, either in solution (gr. iv.–v., Water ʒj.), or in ointment (gr. iv.–v., Lard ʒj.), has been found of great service. *In Porrigo Decalvans*, it is particularly recommended by M. Cazenave. Dr. Ringer speaks highly of the value of the glycerine of tannin in the early stage of *Eczema*, in *Impetigo*, and in the *Intertrigo* of children. It should not be used to the exclusion of constitutional and other local treatment. In a case of *Vascular Tumour of the Orbit*, Mr. Haynes Walton[1] effected a cure by local injections of a saturated solution of tannin; and Dr. Quinlan successfully treated by the same means (Tannin ʒj., Aq. ʒj.) a case of *Nævus* in a child of nine months old. *In Osmidrosis*, Sir E. Wilson (p. 367) states that in one case, where general means had failed to correct the fœtor of the perspiration, tannin effected a complete cure.

2221. Taraxaci Radix. Taraxacum. Dandelion Root. The fresh and dried roots of Taraxacum Dens Leonis, *DC.*

Med. Prop. and Action. Alterative-tonic and diuretic. It has been thought to act specifically on the liver, and to increase the biliary secretion. The researches of Dr. Rutherford[2] prove, however, that it is devoid of cholagogue properties. Its activity apparently resides in a bitter crystalline principle, *Taraxacin.* The uses to which taraxacum has been put are very numerous, but there can be little doubt that its virtues are few and of slight account. It is a mild hepatic stimulant. Formerly, taraxacum enjoyed some reputation as a remedy in *Pulmonary Phthisis.* Dr. Rutherford found it to be a very inefficient purgative.

Dose:—Of the Decoction, fʒij.–iv. *Of the Extract*, gr. x.–xxx. *Of the Fluid Extract*, ʒss.–ʒij. *Of the Expressed juice* (*Succus Taraxaci*), fʒj. iij.

2222. *Therapeutic Uses.* *In Dyspepsia*, it is useful in those cases where the liver is implicated, and in the indigestion of gouty subjects. Dr. Todd speaks highly of it in duodenal dyspepsia, and recommends the following as an efficient formula:—℞ Ext. Tarax. ʒij., Potass. Nit. ʒss., Sp. Æther. Nit. ʒj., Inf. Aurant. ʒvj. M. Two large tablespoonfuls to be taken three times a day. *In Infantile Dyspepsia*, Dr. West advises the following mixture:—℞ Sodii

[1] Ranking's Abstract, vol. xxviii. p. 199. [2] Practitioner, vol. ii. 1879.

Bicarb. gr. xxiv., Ext. Tarax. gr. xl., T. Rhei ʒj., Infus. Calumb. ʒxj., Aq. Carui ʒiv. M. Dose, ʒij. twice a day. *In Tabes Mesenterica*, he reports favourably of the subjoined formula :—℞ Ext. Tarax. ʒij., Sodii Bicarb. ʒj., Ext. Sarzæ ʒiv., Syr. Aurant. ʒiv., Decoct. Sarzæ Co. ʒv. M. Dose, ʒvj. in milk, thrice daily, for a child æt. four years.

2223. *In Chronic Inflammation of the Liver*, taraxacum is by some held to be a valuable remedy. Sir R. Martin stated that *in the indolent Enlargements of the Liver, accompanied with torpid action of the viscus, such as occur in Bengal*, he found mercury of little service; and adds that he has derived more advantage from the following formula, a spare diet and the external application of cantharides being employed at the same time:—℞ Ext. Tarax. gr. xxxvj., Ext. Aloes gr. xij., Ext. Acet. Colchici, Pulv. Ipecac. Rad. āā gr. vj. M. To make twelve pills, of which two were taken every night. *In Incipient Scirrhus of the Liver*, Dr. Pemberton,[1] who warmly advocates the use of this remedy in *all Chronic Hepatic Affections*, states that he successfully employed taraxacum in several instances, in half-drachm doses of the extract, twice daily. As a remedy for chronic affections of the liver generally, it is favourably spoken of by Sir T. Watson. *In Jaundice* depending upon hepatic disease, it may be advantageously combined with small doses of colchicum and other remedies.

2224. *In Dysmenorrhœa*, Dr. Rigby[2] considers that taraxacum proves highly useful, by keeping up a healthy action of the liver, and acting on the cutaneous surface. He directs half a teaspoonful of the extract to be taken in a little warm milk every night. Thus given, it is by no means disagreeable.

2225. Tartaric Acid. Acidum Tartaricum.

Med. Prop. and Action. Refrigerant. Although cheaper, and consequently more used, than citric acid, it is inferior to it in many respects, being more apt to disorder the digestive organs, to produce colic, and to purge. In large doses it acts as an irritant poison. One ounce dissolved in half a pint of water caused violent inflammation of the alimentary canal and death in nine days. (Taylor.) When its employment in medicinal doses is followed by a red and dry tongue, it ought to be discontinued. (Dr. A. T. Thomson.) It is said by Annesley to be the best artificial solvent of mucus, and may be advantageously given when this exists largely in the bowels. It is often given in the form of "effervescing powders" (Sodii Bicarb. gr. xxx., Acid. Tart. gr. xxv.).

Dose, gr. x.–xxx., dissolved in water and sweetened.

2226. *Therapeutic Uses. In Inflammatory and Febrile Diseases*, an agreeable refrigerant drink is made by diluting the acid largely with water, and sweetening with sugar to the taste. If it cause nervous irritability, or a dry red tongue, it should be discontinued (*ante*).

2227. *In Irritability of the Stomach, Nausea, Vomiting, &c.*, effervescing draughts (*ante*) sometimes succeed in allaying morbid gastric irritation. A few drops of tinct. of opium, or hydrocyanic

[1] On Diseases of the Abdominal Viscera, p. 42, et seq.
[2] On Dysmenorrhœa, p. 59.

acid, or tincture of calumba, may be advantageously added. Its efficacy is partly due to the generation of carbonic acid gas, resulting from the mixture.

2228. *In Dyspepsia and other Diseases, attended with copious Secretion of Mucus*, tartaric acid, either alone or combined with a base, particularly the acid tartrate of potash, is stated by Mr. Morgan,[1] of Glasgow, to be of the highest service. It has been advised in *Dysentery*.

2229. *a.* Terebinthina Argentoratensis. Strasburg Turpentine. Obtained from Pinus Picea, *Linn.* *b.* Terebinthina Canadensis. (B. P.) Canadian Balsam or Turpentine. Obtained from Abies balsamea, *Aiton.* *c.* Terebinthina Chia. Chian, or Chia Turpentine. Obtained from Pistacia Terebinthus, *Linn.* *d.* Terebinthina Veneta seu Laricea. Venice Turpentine. Obtained from Larix Europæa, *Linn.* *e.* Terebinthina Vulgaris. Common Turpentine. Obtained from various species of Pinus.

The above terebinthinates closely resemble each other in medicinal properties, being stimulant and diuretic, and exercising a powerful effect upon mucous membranes, particularly those of the genito-urinary organs. Their activity depends upon the volatile oil which they contain, those having the largest quantity being the most efficacious; but the Canada variety is often preferred on account of its less disagreeable flavour.

The Dose is gr. xx.-lx., in emulsion with yolk of egg or mucilage; or the softer kinds may be solidified by the addition of calcined magnesia, and given in the form of a pill. They formerly entered into the composition of several officinal plasters and ointments.

2230. *Therapeutic Uses.* Similar to those of Oleum Terebinthinæ, but much less certain and speedy in their operation.

2231. *In Chronic Gleet*, Chian turpentine has been sometimes given internally with excellent effect. *In Chronic Inflammation of the Prostate Gland*, it is highly spoken of by Mr. Adams,[2] who considers that it exercises a specific action on the prostatic urethra, and gland itself.

Chian turpentine enjoyed an ephemeral reputation as an anti-cancer specific, being warmly advocated by Prof. Clay, of Birmingham. Extensive experience has unfortunately led to the conviction that Chian turpentine is useless in checking the growth of cancer.

2232. Terebinthinæ Oleum. Oil of Turpentine.

Med. Prop. and Action. Stimulant, diuretic, and styptic, in doses of ♏viij.-xxx.; anthelmintic purgative, ʒij.-ʒj. It is best given in emulsion with gum, or with the yolk of an egg, and Dr. Copland advised the addition of tincture of capsicum, which corrects the nausea which the oil occasionally produces. When swallowed, it causes a sensation of warmth in the stomach, at first acting as a stimulant, and afterwards as a depressant of the arterial system; it becomes absorbed into the circulation, and displays its presence in the urine, in the cutaneous secretion, and in the breath. In whatever manner it is introduced into the system, it communicates a violet odour to the urine; when the vapour is inspired, it is perceptible in the urine in fifteen minutes;

[1] Edin. Med. Surg. Journ. No. lv. p. 16. [2] Dis. of the Prostate Gland, 1851.

and when rubbed on the skin, in about twenty-five minutes. In large doses it produces nausea, vertigo, &c., and, in some instances, a cathartic operation; this, however, is very uncertain, but when it does occur, it interferes with its action as a diuretic, its only effect then upon the urine being to convey to it the peculiar violet odour. It is chiefly in small or moderate doses that it seems to affect the urinary organs. In some persons, turpentine, in any form, or in any dose, produces very unpleasant effects; coma, intoxication, violent strangury, and eruptions of the skin. M. Bouchardt found the following symptoms induced by his exposure for five or six hours to the vapour of turpentine:—Sleeplessness, constant restlessness, heat of skin, pulse increased from 65 to 86 beats in the minute, some difficulty in passing the urine, which smelt strongly of turpentine. On the following day there was great lassitude, with weight and pain in the region of the kidneys; these symptoms did not pass off for two or three days. Dr. T. Smith cautions against giving it alone in cold weather, as under such circumstances it tends, like other hydrocarbons, to supply fuel for the evolution of animal heat, rather than to exhibit any therapeutic property; to insure its purgative effect, therefore, it should be conjoined with castor oil. Externally applied, it is a valuable counter-irritant, acting speedily and effectually; for this purpose, hot epithems or stupes are superior to all other modes of application; they may be applied in two ways:—1. By steeping a flannel in hot water, as hot as can be borne by the hand, wringing it out dry, and sprinkling the surface freely with oil of turpentine. 2. By steeping a layer of lint or linen in oil of turpentine, placing it over the affected surface, and immediately applying over it flannel heated as hot as can be borne. For the purpose of inhalation, Dr. Smith advises the vapour to be diffused through an apartment by aid of a spirit-lamp. As a bath, he advises Soda lb. ij., Camphine Oss., Oil of Rosemary ʒss., Water q.s.; he states that it calms the pulse, softens the skin, and renders the respiration easy. When its internal use causes strangury, diluents and demulcents should be drunk plentifully, and opiate enemas employed.

Dose:—Of the Oil of Turpentine, ♏v.-xxx. as an astringent and diuretic; ♏xxx.-lx. as a stimulant and antispasmodic; ʒj.-iv. as an anthelmintic purgative. It may also be given in *Enema* (ʒj., Mucilage ʒxv.). *Of the Confection,* ʒj.-ij. *Prep. for external use: Liniment of Turpentine, Liniment of Turpentine and Acetic Acid,* and *Ointment.*

2233. *Therapeutic Uses. Typhus and Typhoid Fever.* Although the oil of turpentine exercises no direct curative action in these fevers, it is of great value in meeting certain indications, and combating certain symptoms; thus, for the relief of the *Abdominal Tenderness and Pain* in typhoid fever, turpentine epithems are of the greatest service; they also prove most useful in relieving *Tympanitis,* and their benefit is still further increased by the use of turpentine enemas, which may be repeated as often as required with manifest advantage. For arresting *Intestinal Hæmorrhage,* the oil of turpentine (♏x.–xv. every half-hour or hour) is often effectual. Dr. Harley regards it as especially useful in cases where there is a tendency to syncope. Again, in the advanced stages of either of these fevers, when there is great prostration with coma, stupor or delirium, with subsultus tendinum, turpentine, either by mouth or in the form of enema, often arouses the vital powers, and exercises a good influence. *In the Bronchitis of Typhus Fever and other Adynamic Fevers,* the effects of turpentine internally, to use the words of Dr. Murchison, are sometimes marvellous. In extreme cases, when the tubes are filled with secretion, the face livid, and the patient has not the strength to cough, or when other

remedies fail, recourse should be had to turpentine. It may be given as follows:—℞ Ol. Terebinth. ℥x.–xx., Spt. Æther. Sulphuric. vel Chloric. ℥xv.–xxx., Spt. Juniper. Co. ℥xxx., Mist. Acaciæ f℥jss. M. This may be repeated every two hours at first, until the desired effect is produced. After a few doses, the patient often begins to cough and to expectorate large quantities of viscid mucus, with great relief to the respiratory symptoms. Under its use the urine is increased. Next to turpentine, Dr. Murchison thinks the following worth a trial:—℞ Creasoti, Acid. Acetic. āā ℥viij., Spt. Æther. Co., Syrup. āā ℥ss., Aquæ ℥vij. M. Two large tablespoonfuls of this should be taken every two or three hours.

2234. *In Bilious Remittent* (*Yellow*) *Fever*, turpentine, both by mouth and in the form of enema, has been favourably reported of, but further evidence is required to support its claims to utility. Dr. Ward, in the treatment of the *Malarious Intermittents of Ceylon*, found great advantage from the administration of ℥ss.–j. of spirits of turpentine (with a sufficient quantity of castor oil to act as a cathartic) at the commencement of the cold stage. The remedy was repeated every succeeding cold stage, and he states that he frequently found no other treatment was required.

2235. *In Internal Inflammations*, few measures are more generally applicable or more serviceable than hot turpentine epithems. In thoracic inflammations (*Pneumonia, Pleuritis, Bronchitis, and Pericarditis*), no less than in abdominal ones (*Enteritis, Peritonitis, Hepatitis, and Gastritis*) and those of the genito-urinary system (*Uterine, Ovarian, and Vesical*), they may be applied over the seat of the disease with manifest advantage. They may be had recourse to at a far earlier period than blisters, and they seem in many instances to aid materially the operation of internal remedies in arresting the inflammatory action, often giving immediate relief to existing pain and distress. *In Inflammation of the Brain*, they are best applied to the extremities; in these cases turpentine enemas are often productive of good. *In Nephritis*, large linseed-meal poultices are perhaps preferable to these epithems, as the absorption of the turpentine may serve to increase the action of the kidneys. As an internal remedy in inflammation, turpentine is lauded, but it is inferior in efficacy to many other remedies, and its nauseous taste is a great objection to its use. *In the advanced Stages of Inflammation of the Brain*, however, it may be worth a trial. When this is attended by coma, rapid, irregular, and trembling pulse, and great prostration, the following draught, given four hours after a full dose of calomel and camphor, will be found productive of the best effects:—℞ Ol. Terebinth., Ol. Ricini āā ℥ij., T. Capsici ℥xij., Ol. Cajuput. ℥vj., Aq. Menth. Vir. ℥jss. M. *In Chronic Inflammation*, turpentine liniment is preferable to epithems.

2236. *In Internal Congestions, especially of the Lungs and Liver*, the effects of hot turpentine epithems are often most beneficial. They may also be used with advantage in *Congestion of the Spinal Meninges*.

2237. *In Hæmorrhage*, oil of turpentine has long been held in high esteem as a styptic; indeed, John Hunter regarded it as the best, if not the only true one. Although this is by far too high an estimate of its powers, yet in certain non-inflammatory cases it has been found to act speedily and efficiently when given in doses of ℥x.–xx.–xxx. every two or three hours. Cases of *Hæmoptysis, Hæmatemesis, and Hæmaturia* successfully treated by it are on record; but it may admit of a question whether it possesses any superiority as an hæmostatic over acetate of lead, perchloride of iron, ergot, and other less nauseous remedies. Should these fail in the first instance, turpentine is well deserving of a trial.

2238. *In Uterine Hæmorrhage*, turpentine has been characterized as a reliable remedy; the purer and less offensive taste of the kind now sold as "Fir-wood oil" undoubtedly facilitates its exhibition. Dr. Fordyce Barker reports favourably of it in the treatment of *Abortion;* given as an enema, he found it act as an effective oxytocic as well as hæmostatic. In the above case, hot turpentine epithems to the abdomen were also employed. *In Hæmorrhage from Piles*, its internal exhibition, in doses of ʒss. three or four times a day, according to Dr. Burne, not only arrests the bleeding, but prevents its recurrence; in these cases it is a valuable remedy. *In Epistaxis and in Hæmorrhage from Wounds*, it may also be given internally with great advantage; and *in that from Leech-bites, or following the Extraction of a Tooth*, it proves more effectual when locally applied.

2239. *In Epilepsy*, turpentine has the recommendation of several high authorities. It is spoken of as valuable in these cases by Dr. Headland, who prescribes it in half-drachm doses thrice daily, or in a single dose of ʒiij. at occasional intervals, combined with an equal quantity of castor oil.

2240. *In Puerperal Convulsions*, turpentine enemas prove of the highest service; they are advised by Sir C. Locock both in the active and in the atonic varieties. *In the Convulsions of Children*, Dr. Copland advises the use of turpentine liniment, to be rubbed on the epigastrium and abdomen or along the spine. Dr. Graves (i. p. 584) mentions a case in which the following mixture proved successful when other remedies had failed:—℞ Ol. Terebinth. ʒj., Ol. Ricini ʒiv., Syr. Papav., Mucilag. Arab., Aq. Fœnic. āā ʒij. M. In ʒj. doses every three hours. *Puerperal Mania*, when it assumes a chronic form, is best treated by stimulants. Of these, Dr. Prichard says the oil of turpentine, when not offensive to the stomach, is the best we can employ. Dose, ʒj. thrice daily, in cinnamon-water.

2241. *In Tetanus*, turpentine occasionally exercises a beneficial influence. Dr. Philips [1] details a case in which the jaw fell immediately after the administration of an enema containing it; and other instances are recorded in which it appears to have mitigated

[1] Med.-Chir. Trans. vol. vi. p. 65.

the severity of the symptoms. It is chiefly adapted for idiopathic tetanus. In a case under my care, relaxation of the spasms followed the exhibition of ℥ij. of oil of turpentine with ℥j. of castor oil, the patient soon afterwards passing six long worms (*Lumbrici*). It should not be trusted to alone, but it proves a valuable adjunct to other remedial measures.

2242. *In Apoplexy*, turpentine enemas, and counter-irritation by hot turpentine epithems to the extremities, are measures sometimes attended with beneficial results. When the patient can swallow, a full dose, with an equal quantity of castor oil, may be given internally as a purgative.

2243. In the more obstinate cases of *Sciatica*, Dr. Anstie considers that its internal administration (♏x. thrice daily) is at least worth a trial, although, he adds, it is commonly very disagreeable to the patient.

2244. *In Lumbago*, of internal remedies, none, according to Dr. Fuller, proves more useful, when the bowels are regular and the urine clear and abundant, than oil of turpentine in doses of ♏xx.–♏xxx., and few are less serviceable when the bowels are costive and the urine is high coloured and loaded. It may be given as follows:—℞ Sp. Terebinth., Mucilag. Acaciæ, Mellis., āā f℥ss. Dose, a teaspoonful thrice daily. (Dr. Fuller.) Much relief sometimes follows the application of hot turpentine epithems, and also from frictions with turpentine liniment.

2245. *In Chronic Rheumatism*, Dr. Fuller speaks highly of the oil of turpentine, in doses of ʒss.–ʒj. Were it not for its nauseous flavour, and for the strangury which often follows its use, he considers that it would be very generally adopted as a cure in obstinate and protracted cases. He found it sometimes particularly useful combined with bark. Its external application, as advised in the last section, sometimes affords manifest relief.

2246. *Diseases of the Abdominal Viscera. In Spasmodic Affections of the Bowels*, hot turpentine epithems often prove most serviceable, even when ordinary fomentations fail of affording relief. *In Flatulence and Flatulent Colic*, a turpentine enema is often productive of much good. *In Ileus*, Dr. Copland remarks that, notwithstanding constant or even fæculent vomiting, advantage will sometimes be derived from a full dose (ʒiv.–ʒx.) of the unrectified oil of turpentine, taken with aromatics, &c. He adds that he has seen the vomiting cease, and the distension of the abdomen rapidly subside, immediately after this draught, which should be repeated if the former is rejected. This treatment must, however, be followed with extreme caution. *In Colica Pictonum*, it also proves of great service.

2247. *In Cholera*, hot turpentine epithems applied successively to the abdomen, over the cardiac region and along the spine, and to the extremities, appear often materially to aid other remedial measures in stimulating the system and raising the vital powers. Turpentine frictions and turpentine enemas may also be resorted to as aids to other treatment. Its internal administration, as

advised in hæmorrhage (sect. 2237), promises to be a remedy of value, and is well worthy of further trials.

2248. *In the advanced stages of Acute Dysentery, and also in the typhoid and malignant forms of this disease,* Dr. Copland speaks highly of the value of turpentine epithems applied to the whole abdomen, and allowed to remain on as long as the patient will endure them. The most usual effects are a very copious perspiration, with burning heat of the skin where they are applied; and, consequent on these, a total remission of the tormina and tenesmus. *In Chronic Diarrhœa,* the same applications are often of great service.

2249. *As a solvent of Biliary Concretions.* Durande's well-known solvent of bile calculi consisted of two parts of sulphuric ether and three of turpentine. It is often very useful in the treatment of biliary concretions, although not on account of its solvent properties.

2250. *In Ulcer of the Stomach,* turpentine epithems and sinapisms to the epigastrium tend to relieve the pain; they are chiefly useful in chronic cases in which the strength is reduced. In comparatively recent cases in the young and well-nourished, blisters are preferable. When the powers of the system are exhausted by constant vomiting, and pain still forms a prominent symptom, dry-cupping is more effectual than turpentine.

2251. *Against Worms, particularly A. Lumbricoides, and Tænia or Tape-worm,* the oil of turpentine is very effectual. It appears to act specifically on the worms, as under its use they are generally expelled lifeless. It is best given two or three hours after a meal; if taken on an empty stomach, it is apt to produce vomiting; the patient should remain quiet after taking it, the remedy being then less likely to disturb the stomach; broths and mucilaginous drinks should be taken during its operation. Dr. Headland[1] found it act effectually in doses of ʒiij. combined with an equal quantity of castor oil; the latter, he observes, prevents those unpleasant head symptoms which are apt to arise when the turpentine is given alone. He regards this combination as superior to the oil of male fern. Dr. West (p. 638), while admitting it to be a very efficacious remedy, observes that the violent effects which it sometimes produces, as well as the temporary intoxication which follows its administration in a large dose, have withheld him from giving it to children. Still, he adds, it is to be borne in mind that it is a most energetic vermifuge; while the unpleasant symptoms that follow its use are not dangerous, and soon pass away, especially if it be given with an equal quantity of castor oil. For the removal of *Ascarides Vermiculares, or Thread-worms,* a turpentine enema often proves effectual.

2252. *In Diseases of the Genito-urinary Organs,* the oil of turpentine exercises a powerful influence. *In Amenorrhœa,* turpentine enemas have been employed with great success. An enema may be employed of ʒss. of the oil and Oj. of barley-water, repeated once

[1] Lancet, Jan. 6, 1866.

or twice a day, this will sometimes cause a speedy return of the catamenia.

2253. *Gonorrhœa, Gleet, and Leucorrhœa,* when chronic and unattended by inflammatory symptoms, often improve under turpentine, in small and repeated doses.

2254. *In Suppression of Urine,* Dr. Pereira found oil of turpentine succeed in reproducing the urinary secretion when other powerful diuretics had failed. It has also been advised in *Ulceration, and some other Chronic Affections of the Kidneys and Bladder,* but, though doubtless of great service in proper cases, it is far from being a remedy to be indiscriminately employed; so long as any acute inflammatory symptoms are present, there is danger of its increasing them by its stimulant properties. The milder terebinthinates are generally preferable.

2255. *When a Urinary Calculus is present in the Bladder, it often gives rise to intense agony;* this may sometimes be relieved by an enema composed of ʒss. of oil of turpentine, mixed with the white of an egg, and Oj. of barley or rice water.

2256. *Diseases of the Chest.* In cases of *extremely severe or neglected Bronchitis associated with Emphysema of the Lungs,* when the surface of the body becomes cold and the pulse exceedingly small and feeble, and when, from the accumulation of fluid in the bronchial tubes, and the inability to expectorate, asphyxia is threatened, ordinary stimulants prove of little avail. Large doses of turpentine often give relief. Valuable as it is, caution is necessary in its use; it should not be given in large doses at first, or it may produce great depression; the best plan is to begin with ℥xxx.–lx. every two or three hours, and then, if necessary, to give a larger dose (up to ʒss.) less frequently. *In Chronic Bronchitis,* the following liniment, supposed to be an imitation of that used by St. John Long, is serviceable:—℞ Ol. Terebinth. ʒiij., Acid. Acet. Fort. ʒss., Vitel. Ovi j., Aq. Rosmar. ʒijss., Ol. Limon. ʒj. M. This should be well rubbed in over the chest, the nape of the neck, also over the epigastrium, and in the course of the cervico-spinal and pneumogastric nerves generally. *In Gangrene of the Lungs,* Skoda successfully employed terebinthinate inhalations prepared by pouring the spirit of turpentine on boiling water; the patient is directed to inhale the vapour for fifteen minutes every two hours.

2257. *In Asthma and Angina Pectoris,* hot turpentine epithems to the chest often seem to mitigate the severity of the paroxysms; they are especially useful in the old and debilitated. Applied over the cardiac region, they often mitigate in a marked degree *Nervous and Hysterical Palpitations.*

2258. *In various Throat Affections,* Dr. Symonds[1] speaks highly of a combination of equal parts of glycerine and oil of turpentine. Whether, he remarks, the throat be red and puffed, or pale and œdematous, or studded with superficial ulcers, or opaque yellow patches of epithelium, this combination is at once curative and

[1] Brit. Med. Journ. March 14, 1868.

comforting. He mentions a severe case of *Ulceration of the Tonsils*, which, after resisting nitrate of silver and other remedies, was cured by it. *In simple Catarrhal Diseases*, Dr. Beigel[1] has derived benefit from turpentine inhalations.

2259. *In Purpura Hæmorrhagica*, Dr. Neligan[2] employed oil of turpentine with invariable benefit; he gave it in doses sufficient to purge freely, which object is more certainly attained by combining it with castor oil.

2260. *In Melæna*, oil of turpentine has been successfully employed. An excellent formula is as follows:—℞ Ol. Terebinth. gutt. xxv., Aq. Cinnam. ʒj., Syr. Aurant. ʒj. M. A draught to be taken three times a day.

2261. *In Chronic Enlargements of the Joints, and for Bruises and Sprains*, turpentine liniment is a serviceable application.

2262. *Irregular Gout.* When much flatulent distension and severe colicky pains attend the internal seizure, or remain after other medicines are employed, equal parts of oil of turpentine and of castor oil (ʒij. to ʒvj. of each) may be given on the surface of an aromatic water, with or without a warm tincture; and an enema containing the same oil may be administered a few hours afterwards, to promote its operation.

2263. *In Deafness depending upon deficient secretion of Cerumen*, much benefit attends the following application:—℞ Ol. Amygdalæ vel Glycerini ℥ss., Ol. Terebinth. gutt. xl. M. Of this, a few drops may be dropped into the meatus, or introduced on a small piece of cotton.

2264. *For Chilblains*, a liniment composed of equal parts of turpentine, camphor, and olive oil, or of equal parts of turpentine and copaiba, is stated to prove very serviceable.

2265. *Porrigo Decalvans*, according to Dr. A. T. Thomson, seldom resists the application, twice or thrice daily, of a liniment composed of one part of the spirit of turpentine and two of alcohol.

2266. *Ulcers of the Extremities.* The internal use of turpentine appears, in these cases, to hasten the healing process. Thus:—℞ Sp. Terebinth. ʒvj., Pulv. Acaciæ ʒvj., Aq. Menth. Pip. ℥vij. M. Two tablespoonfuls three times a day.

2267. Thebaina or Paramorphina. An alkaloid obtained from opium.

Med. Prop. and Uses. It occurs in the form of minute, colourless, rectangular plates or prisms, of an acrid styptic taste, soluble in about forty-five parts of alcohol, more soluble in ether, and still more so in chloroform, and separating from these solvents in silvery crystals of the original form. Thebaine may be regarded as the tetanic constituent of opium, its operation closely resembling that of strychnine. Dr. Harley (p. 182), after detailing some interesting experiments on animals by the subcutaneous injections of solutions of this alkaloid, concludes that it acts almost exclusively on the motor centres, inducing in them that highest degree of excitement which results in cramp, and which is only fatal to life because it arrests the respiratory movements. It exercises no direct action on the heart; and, so long as the excitant

[1] Practitioner, Aug. 1868. [2] Dublin Med. Journ. vol. xxviii. p. 189.

action is moderate, only acceleration of the breathing and some distress from over-excitement of the vagus, together with general muscular twitches, result. In one of Dr. Harley's experiments on a dog, in which gr. ij. in acetous solution were injected, the intensity of the rigor or spasm was such that the stiffened and motionless body could be held straight out by one of the hind legs. Death, in this case, ensued forty-five minutes after the administration of the poison. Unlike the soporific constituents of opium, the action of thebaina is comparatively transient.

2268. THEOBROMATIS OLEUM. Oil of Theobroma. Cacao Butter. The concrete oil of Theobroma Cacao, *Linn.*

Med. Prop. and Action. Emollient. Employed chiefly for pharmaceutical purposes, in which it has the great advantage of not becoming rancid on exposure to the air. It is an ingredient in all the officinal suppositories. It has no special therapeutic uses.

2269. THUS AMERICANUM. Common Frankincense. The concrete turpentine of Pinus Tæda, *Linn.*, and P. Australis, *Mich.*

Med. Prop. and Action. It is only used externally as a stimulant, with other ingredients, in the form of plaster. It is contained in the Emplastrum Picis. (See PIX BURGUNDICA.)

2270. THYMOL. Thymol. A stearoptene, obtained from the volatile oils of Thymus vulgaris, *Linn.*, and other plants, esp. Ptychotis Ajowan, *DC.*

Med. Prop. and Uses. Thymol is methyl-ethyl phenol, and occurs in large, colourless, prismatic crystals. It has also been prepared synthetically from cuminol (cumin). Soluble in water ($\frac{1}{800}$), alcohol, acetic acid, caustic alkalies, and in fats and oils.

It has a hot, aromatic taste, and causes a sensation of warmth and discomfort in the epigastrium. Küssner took in twenty-fours 15 grains without inconvenience, nor were any of the functions disturbed. Epigastric pain persisted for some time *after* the medicine was discontinued. Intra-peritoneal injections caused death. There was profound narcosis, with slowing of the respiration, which was succeeded by paralysis of the centres. According to Lewin, thymol paralyzes the end organs of the sensory nerves. The blood was dark, but the corpuscles were uninjured. Strychnine was powerless to counteract the thymol coma. In animals kept alive for some time there was marked loss of flesh, and depreciation in general health. Thymol has a strong claim as an antiseptic and preventive of putrefaction. It was incorporated in the B. Ph. 1885.

Preparations and Doses:—Of Thymol, gr. ss.–ij. (B. Ph.). *Spirit of Thymol*, ♏iij.–xv. *An Ointment*, gr. v.–xxx. to ʒj. *A Vapour*, Thymol gr. vj., Spir. Rect. ʒj., Magn. Carb. lev. gr. iij., Aq. ad ℥j. ʒj. to Oj. of water, at 148° F. (Martindale). *Volckmann's Spray:* Thymol, 1 part; Alcohol and Glycerine, each 20 parts; Water to 1000.

2271. *Therapeutic Uses. In Antiseptic Surgery.* As an antiseptic, thymol is used as a vapour, for saturating gauze afterwards used for surgical dressings, and for checking fermentation and putrefaction. Bucholtz found that thymol (1 in 2000) checked the development of bacteria in a cultivation fluid; while, according to Lewin, 1 in 1000 arrests saccharine fermentation. Thymol was largely employed in Volckmann's clinic with success. It is said by him to be greatly superior to its congener, carbolic acid. In uterine surgery, thymol is safer than carbolic acid and as efficient, while its odour is agreeable.

2272. *For Burns and Scalds.* The practice of Dr. Fueller, of Neukirchof, is first to place his patient in a warm bath. The burns are then washed in thymol-water (1 in 1000), and then sprayed with thymol. The raw surfaces are then painted with thymol in linseed oil (1 in 100). It is necessary to avoid pressure upon the burns, and the thymol should be frequently painted on.

2273. *In Phthisis*, an inhalation of 1 in 1000 lessens fever and expectoration.

2274. *In Diabetes Mellitus*, although it is difficult to understand its action, yet Küssner believes he has seen the condition of patients affected by this disease favourably influenced by thymol in quantities varying from gr. xv. to gr. xxx. in twenty-four hours; the amount of sugar being lessened.

2275. *In Catarrh of the Bladder*, thymol, taken internally, will in many cases prove very serviceable. Doses of ℥ij. to ℥v. of a 1 per cent. solution, should be employed.

2276. The *Diarrhœa of Children*, especially when the motions are offensive, yields to this remedy, acting, it would seem, as an antiseptic, and so restoring the secretions of the intestines to a healthy condition.

2277. *In Skin Diseases*, thymol justly takes a prominent position. Dr. Radcliffe Crocker uses thymol in *Psoriasis* and in long-standing cases of *Eczema*. *In Lichen Agrius*, it is necessary to use a more soothing preparation to commence with, adopting thymol when the case is less acute. *In Parasitic Diseases—Tinea tonsurans, T. versicolor, and T. circinata*—thymol is beneficial. *For Ringworm*, Mr. Malcolm Morris uses Ether ʒv., Sp. Rect. ʒijss., Thymol ʒss., as a lotion, to be dabbed on, while glycerine and perchloride of mercury are used between times.

2278. *The Pain of Carious Teeth* is often allayed by applying a pledget soaked in thymol. It has been used in the preparation of soaps for cosmetic purposes, and answers well. It possesses the desirable property of removing the odour of tobacco.

2279. As a remedy for *Spasmodic Cough, Pertussis, &c.*, thymol tea has been recommended, but we have had no experience of its efficacy in this connection.

2280. Tonga. A name given to a preparation derived from Raphidophora vitensis, a native araceous plant of Fiji.

Med. Prop. and Action. The active principle is, according to Mr. Gerrard, of University College Hospital, an alkaloid tongerine. Chloride of potassium is also present. A liquid extract was employed by Drs. Ringer and Murrell,[1] and in their hands tonga proved a safe and effectual remedy for *Neuralgia*. Mr. Bader confirmed these results, and further employed tonga in *Ophthalmic Practice*. He found, without dilating or contracting the pupil, it relieved intra-ocular tension, and afforded great relief from neuralgic pains in and about the orbit. The dose employed for internal administration should be from ʒj. to ʒij. of the liquid extract three times a day.

[1] Lancet, 1880.

2281. Tragacantha. Tragacanth. A gummy exudation from the stems of Astragalus verus, *Olivier*.

Med. Prop. and Action. Emollient and demulcent; its virtues in this respect residing in two distinct gummy principles, *Arabin* (53 per cent.), and *Bassonin*, sometimes called *Tragacanthine* (47 per cent.).

Dose:—Of Powdered Tragacanth, gr. xv.–xx. in emulsion. *Of the Compound Powder*, gr. xx.–lx. *Of the Mucilage*, f℥j.–iij.

2282. *Therapeutic Uses. In the Cough of ordinary Catarrh, in that of Phthisis, &c.*, the compound powder, in emulsion with syrup of poppies or other sedatives, proves very useful in allaying the irritation. With liquor potassæ and hyoscyamus, it is very effectual in allaying *Ardor Urinæ in Gonorrhœa*. Combined with ipecacuanha, it also proves useful in *Dysentery*. Prof. Miller[1] advises the application of a thick, semi-fluid, aqueous solution of gum tragacanth to *Granulating Surfaces*, in order to protect them from the action of the air. It creates no irritation.

2283. Treeak Farook. A thick, soft, black electuary, much used in India in many affections characterized by œdema. It is an imported article, and, from a printed paper in Persian characters which accompanies each canister, it is professedly the Theriaca Andromachi of old writers, and is prepared at Venice, whence it is exported to the East.

2284. *Therapeutic Uses. In Beriberi*, it has been extensively used in doses of gr. v.–xv. in the form of a pill. Dr. Malcolmson[2] advises the following formula:—℞ Pulv. Rhei ℥ijss., Treeak Farook ℥ss., Conf. Aromat. ℥ss., Mellis q.s. This mass is to be divided into forty-eight pills, and two or three of these are to be taken every night and morning. If it purges, the quantity of rhubarb must be diminished. It often fails in the acute stage, and has little influence on the paralytic symptoms. It is chiefly useful in chronic cases when œdema forms the principal feature. The sparing use of fluids favours its operation.

2285. *In Œdema of the Face*, unconnected with beriberi, occurring in the natives of India, it often proves signally beneficial when persevered in for two or three weeks. *In the Chronic Rheumatism* of the natives of India, which is often attended with œdema, it also proves very serviceable.

2286. Triticum repens, *Linn.* Couch Grass. Dog's Grass.

Med. Prop. and Action. The underground stem or "root" is demulcent and diuretic, and has been thought by some Continental writers to partake of the properties of sarsaparilla. It is given in decoction (℥ij., Water Oj. boiled for 15 minutes and strained) to the extent of ℥xij.–℥xvj. daily, in divided doses. The taste of this decoction is rather agreeable than otherwise, and it produces no nausea nor derangement of the stomach.

[1] Brit. and For. Med.-Chir. Rev. Jan. 1851. [2] On Beriberi, p. 296.

2287. *Therapeutic Uses.* Sir Henry Thompson introduced its use in 1861, speaking highly of it as a sedative-diuretic, especially useful in *Inflammation of the Bladder, Urethra, and Kidneys.* He also found benefit followed its use in cases of *Renal Calculus* and *Prostatic Enlargement* in old men.

2288. UVÆ URSI FOLIA. Bearberry Leaves. The dried leaves of Arctostaphylos Uva-Ursi, *Spreng.*

Med. Prop. and Action. Astringent and diuretic. Their astringency is due to the presence of tannic and gallic acids; of the former they contain about 36 per cent.

Dose:—Of the Powdered Leaves, gr. x.–xxx. *Of the Infusion,* f℥j.–ij.

2289. *Therapeutic Uses. In Leucorrhœa,* it occasionally proves useful. It may be given internally in doses of gr. xxx.–lx., twice or thrice daily. *In Chronic Gonorrhœa and Gleet,* it may be given with advantage.

2290. *In irritable states of the Bladder, particularly when these are the consequence of Disease of the Kidneys,* the uva ursi may be exhibited with much advantage. It may be given in doses of from ℥j.–ij. of the extract daily; or from ℥viij.–xvj. of the following infusion:—℞ Fol. Uvæ Ursi ℥j., Aq. Ferv. ℥xviij. Macerate for two hours, boil down to ℥xvj., and strain. It requires to be persevered in for a considerable period before its good effects appear. If uric acid be present in the urine, small doses of potash or liq. potassæ may be added; and if the urine be highly alkaline, the mineral acids may be substituted. Dr. Prout considered it more particularly useful when the affection of the bladder partakes more of an irritative than an inflammatory character.

2291. *In Chronic Cystitis and Cystirrhœa,* when the discharge from the bladder is copious, the decoction often proves highly beneficial in doses of not less than half a pint daily.

2292. *In Chronic Bronchitis,* and *excessive Mucous Discharges,* uva ursi is valuable.

2293. VALERIANÆ RHIZOMA. Valerian Rhizome. The dried rhizome of Valeriana officinalis, *Linn.*

Med. Prop. and Action. Stimulant, antispasmodic, and vermifuge. Active principles, a volatile oil, and an acid fatty matter, *Valerianic Acid,* which forms soluble salts with bases. It ranks in efficacy next to assafœtida, and is said to be a useful adjunct to cinchonine in intermittents. Its unpleasant taste is effectually concealed by combining it with cinnamon.

Dose:—Of the Powdered Root, gr. x.–xxx. *Of the Infusion,* ʒj.-iij. *Of the Tincture,* ʒj.–ij. *Of the Ammoniated Tincture,* ♏xxx.–lx. *The Volatile Oil* (not officinal), in doses of ♏ij.–v., is a good form for administration.

2294. *Therapeutic Uses. In the Typhoid state of Fevers,* the infusion of valerian is sometimes useful. It is indicated in such states of fever as require a gentle tonic and nervine stimulant, particularly when the nervous symptoms are prominent, although the head be

cool and the pulse weak; under these circumstances, it may be advantageously conjoined with camphor or tonics. *In the Coma of Typhus*, the essential oil of valerian was employed by Barrallier. Dose, ℥j. in syrup and water every half-hour until ℥v.–viij. have been taken. (Murchison.)

2295. *In Hooping-cough and Laryngismus Stridulus*, Dr. G. Hill speaks highly of the value of valerian. In the former, especially, he found it serviceable in alleviating the cough; producing a marked diminution within forty-eight hours, not only in the frequency of the paroxysms, but in their severity. He does not mention the dose or form employed.

2296. *In Diabetes Mellitus and Insipidus*, valerian, in large and rapidly increasing doses, was found by Rayer of great service, and Trousseau relates cases cured by its means. Dr. Reith details a case in which it proved serviceable given in doses of gr. lx. increased to gr. cxl. daily, during the eleven days the patient was under treatment. Bouchard claims that valerian lessens the amount of sugar excreted, as well as decreases the quantity of the urinary water. Its effects are transient.

2297. *In Neuralgia, particularly when associated with Hysteria*, the ammoniated tincture, combined with guaiacum, sometimes exercises a favourable influence.

2298. *In Hysteria*, it proves very highly serviceable, and may be advantageously given, both during the paroxysms and in the intervals. In some cases, its beneficial effects are immediate; in others, the remedy requires to be persevered in for a short period. *In Hysterical Headaches*, it is particularly serviceable. Dr. Conolly advises the following formula:—℞ T. Valerian. Ammon., Sp. Æther. Sulph. Co. āā ℥xxx., Mist. Camph. f℥jss. M. Or ℞ T. Valerian. Am. f℥j., Acid. Sulph. Dil. ℥xv., Mist. Camph. f℥jss. M. A draught to be taken twice or three times a day. Dr. Ashwell speaks highly of the following:—℞ T. Valerian., Sp. Æther. Sulph. Co., Sp. Lavand. Co. āā ℥xxx., T. Hyoscyam. ℥xx., Mist. Camph. f℥x. M. *In Hysterical Palpitations*, the use of valerian is often attended with benefit. Either of the preceding formulæ may be given advantageously.

2299. *Muscæ Volitantes*, according to the experience of Mr. Ware, often disappear under the use of the annexed formula:—℞ T. Valerian. Am., T. Castor. āā f℥ij., Mist. Camph. f℥vj. M. Of this one or two tablespoonfuls should be taken for a dose.

2300. *In Flatulent Distension of Hysteria*, and *in the Colic of Infants*, valerian often proves of service.

2301. Vaselinum. Vaseline. Petroleum Jelly.

Med. Prop. and Action. According to Martindale,[1] who introduced vaseline into use in England, vaseline is derived from the lower strata of the petroleum wells of Pennsylvania. It is purified by gently simmering and repeated filtration through charcoal, the volatile impurities escaping into the air. It is of a pale lemon colour, is bland, unirritating, and devoid of smell and taste.

[1] Extra Pharmacopœia, 133, 3rd ed.

Vaseline neither oxidizes nor saponifies, and so does not become rancid. It is insoluble in water, but it can be washed off. When melted it combines with oils, melted fats, paraffin, wax, oleates (*q.v.*), and oleic acid. Thymol, menthol, and salicylic acid readily dissolve in vaseline, as does chrysophanic acid, although to a less degree. Carbolic acid dissolves 1 in 20 parts. The alkaloids also dissolve in it—atropine 1 in 40; morphine 1 in 200; quinine 1 in 80; veratrine 1 in 80. When, however, oleates of the alkaloids are used, their solubility in vaseline is increased. Vaseline as a basis for ointments is better than lard, &c., as it does not become rancid; it is cheap, and possesses a cool, agreeable feel when applied. Vaseline and its allies are not absorbed by the skin, and hence, when absorption of the active agent in the ointment is desired, some fatty excipient should be used. Vaseline is an admirable lubricant for the skin, and hence is adapted for the treatment of *Chapped Hands*, *Cracked Lips*, *Sore Nose*, &c. Vaseline is a useful protection to the hands in the conduct of autopsies, or after exposure to carbolic spray. Mr. Martindale, drawing attention to the fact that the very softness of vaseline leads to its soaking into the dressing and so leaving the skin unprotected, suggests as a firmer and less soluble preparation, a mixture of vaseline with paraffin, in the proportion of 2 to 1. They are to be melted, mixed, and allowed to cool. This mixture requires a heat of 125° F. to effect its liquefaction. Various preparations more or less closely resembling vaseline are, cosmoline, fossiline, chrismine and ozokerine, and adepsine. (See also PARAFFINUM MOLLE.)

2302. VERATRINA. Veratrine. An alkaloid obtained (not quite pure) from Sabadilla (*q.v.*). It exists also in the rhizomes of Veratrum album and Veratrum viride, *Linn.*

Med. Prop. and Action. Acrid and sedative; but from the violence of its action it is rarely administered internally. Externally, it is used in the form of embrocation (gr. lx., Proof Spirit ℥ij.) or ointment. Its action is directed chiefly on the spinal cord. After veratrine has been swallowed, the patient experiences a dull, burning pain in the sacral region, various uneasy feelings through the abdomen, increased watery and slimy evacuations from the bowels, but seldom any diuresis. If smelt, it produces repeated and long-enduring attacks of sneezing. If its use be continued, it causes dryness and a sense of burning in the mouth, intense thirst, salivation, nausea, vomiting, bloody stools, coldness of the limbs, trembling, syncope, delirium, and paralysis; the urine is generally scanty, thick, and of a deep-red colour. (Reiche.[1]) When rubbed on the cuticle, it produces a strong sensation of tingling, as if a succession of small electric sparks were being administered on an uncovered part of the body; this feeling is transitory. The pulse is weakened, the beats lessened in number, and respiration interfered with. Prof. Wood finds that the muscles in cases of veratrine poisoning have after death lost more or less completely their irritability. If an artery be tied before the veratrine is given, the muscles remain intact. Hence veratrine is a muscle poison. The involuntary muscles also suffer. Thus, as Dr. Ringer has shown, the cardiac muscle is influenced quite as much as the voluntary. It becomes irregular and inco-ordinate in its action before it dies. Veratrine kills by producing asphyxia. It may be rubbed on the skin for a short time without producing any redness of the parts. Dr. Reiche observed that its endermic use on the epigastrium excited nausea, a sense of tightness of the chest, electric-like dartings through the chest and abdomen, and painful twitchings of the limbs. The commencing dose is gr. $\frac{1}{40}$–$\frac{1}{30}$ in the form of pill, gradually and cautiously increased to gr. $\frac{1}{6}$. For external use, the officinal ointment is a good form:—Rub. Veratrine gr. viij. with Olive Oil ℥ss., and then mix thoroughly with Lard ℥j.

2303. *Therapeutic Uses. In Neuralgia, Tic Douloureux, and Hemicrania,* Dr. Turnbull speaks highly of the external

[1] Med.-Chir. Rev. No. lxvii. p. 232.

application of veratrine ointment, rubbed in until it causes a sense of heat and tingling. Occasionally it affords great temporary relief, but often fails entirely; it is inferior in every respect to aconitine. Veratrine may be advantageously applied in the subjoined form: ℞ Veratrinæ gr. xx.–xxx., Sp. Rect. ʒvj., Glycerini ʒij. This should be applied with a camel-hair brush night and morning, and well rubbed in along the course of the affected nerve. Like aconitine, it proves useless so long as any active or inflammatory symptoms are present. *In Chronic Gout and Rheumatism*, in the absence of inflammatory symptoms, veratrine ointment (gr. xxx., Ung. ʒj.) is advised by Dr. Turnbull, and appears occasionally to be of service. *In Gout*, it has the recommendation of Sir Charles Scudamore.

2304. *In Pneumonia*, veratrine has proved very effectual in the hands of Prof. Vogt,[1] of Berne. He commences with gr. $\frac{1}{13}$ every two or three hours, until it produce vomiting or diminution of the pulse. Although Prof. Vogt's results seem satisfactory, it must be borne in mind that veratrine is a most depressing drug, and its advantages seem hardly to counterbalance its drawbacks.

2305. *In Paralysis*, the diligent use of veratrine externally is occasionally followed by great improvement; but it often fails to effect any beneficial change; it should be persisted in till it produces the tingling sensation above described. *In Incontinence of Urine in Adults*, Dr. Kennard, of New York, found the following ointment, rubbed into the perinæum thrice daily, an effectual application:—℞ Veratrinæ, Morphinæ Sulph. āā gr. x., ad Ung. ʒj. M. *In Dysmenorrhœa*, M. Vannaire found that half a drachm of an ointment containing $\frac{1}{100}$ its weight of veratrine, rubbed over the hypogastric region twice daily, greatly relieved the pain.

2306. Veratri Albi Rhizoma. White Hellebore Rhizoma. The dried rhizome of Veratrum album, *Linn.*

Med. Prop. and Action. Purgative and emetic in doses of gr. j., gradually increased to gr. v.; in large doses it acts as an acro-narcotic poison; it is an uncertain and dangerous remedy, and has justly been discarded as an internal remedy in British practice. Its activity resides in the alkaloids *Jervia* and *Veratralbia* (Mitchell), but at present it is uncertain whether there are not other alkaloids concerned in the action. Externally it has been used in the form of ointment (ʒij., Lard ʒviij., Oil of Lemon ♏xx.) in *Ringworm*, *Scabies*, and other skin diseases, and also *for destroying Pediculi*, but its use is not devoid of danger, as the active principle is apt to become absorbed into the system and produce poisonous effects. It is seldom used internally.

2307. *Therapeutic Uses.* Very limited at the present day. It formerly enjoyed high repute in *Insanity*, *Epilepsy*, and other nervous affections, but it has been superseded by safer remedies. *In Gout and Rheumatism*, it has been proposed as a substitute for colchicum, but Dr. Garrod states that its action differs completely from that of colchicum, producing a burning sensation of the œsophagus, parched mouth, and intense thirst, accompanied by great depression, without any alleviation of the gouty symptoms.

[1] Bull. Gén. de Thérap. Jan. 1860.

It has been used successfully in the *Vomiting and Purging of Summer Diarrhœa.* (Ringer.)

2308. VERATRI VIRIDIS RHIZOMA. Green Hellebore Rhizome.

Med. Prop. and Action. In small medicinal doses it is a powerful arterial sedative, reducing the force and frequency of the pulse in a remarkable degree. In addition to this depressing effect on the arterial system, and often independently of it, it occasions nausea, together with a feeling of prostration and a sense of weakness, or want of due command in certain muscles. When carried so far as to produce nausea and vomiting, its depressing effects on the circulation and nervous system are often very remarkable. The pulse falls from 75 or 80 down to 35 or 40, and at the same time becomes small, feeble, and occasionally almost imperceptible. The surface is pale and covered with a cold sweat; the patient at the same time experiencing a sense of chilliness, and sometimes of tingling and numbness. Headache, vertigo, dimness of vision, with dilated pupils, faintness, a feeling of stiffness of certain muscles and a want of command over them, are other symptoms evincing the sedative operation of the medicine; these are sometimes so great as to become alarming. This depressing operation is attended with stimulation of the secretory functions; the salivary, pulmonary, biliary, and urinary secretions are increased, it is said, by doses insufficient to occasion nausea or vomiting, whilst during the existence of the latter condition the same effect is produced on the function of the skin. Excessive action of any kind is easily controlled by opiates and alcoholic stimulants. With regard to the emesis produced by this agent, it is worthy of remark that its operation is very tardy, three-quarters of an hour or more often elapsing before this effect is produced. Locally applied, it is a powerful irritant; its powder snuffed up into the nostrils excites long-continued and violent sneezing, and applied to the skin in a moist state produces redness and burning. Compared with digitalis, it is sure, prompt, and not cumulative. Dr. Ringer (p. 299), however, considers that in its action it is more nearly allied to aconite than to digitalis. Compared with antimony, its effects are not as permanent, but it does not seem to directly change the character of the blood, and it does not purge. Only two instances of fatal poisoning by it have been recorded. In one case a child æt. eighteen months was killed by ɱxxxv. of the tincture, while the other, the case of an adult, is somewhat doubtful.[1] No doubt the vomiting produced is a great safeguard.

The *dose* of the powdered root is gr. j.–ij. every third hour, and may be increased, if necessary, till it produces its physiological effects. In doses of gr. iv.–vj. it generally acts as an emetic, but in this character it is very objectionable, from the prostration which accompanies its operation. The best form is the officinal tincture (B. Ph.) (Green Hellebore Root in coarse powder ʒiv., Rect. Spirit Oj.), of which the dose is placed at ɱv.–xx. For ordinary cases, however, these doses are stated to be too large, ɱij. every two hours being preferable. On the development of any of its physiological effects, the dose should be diminished or the remedy discontinued, and if resumed it should be given in smaller doses. Its external application is not advisable, from the liability of its absorption into the system.

2309. *Therapeutic Uses. In Inflammations,* observes Prof. G. B. Wood (ii. p. 155), the medicine acts only as a sedative, and not probably by changing the character of the blood; it should not, therefore, be used to the exclusion of other measures calculated to meet the latter indication. But when the state of the system does not admit of depletion, it may sometimes, doubtless, be employed with advantage.

2310. *In Pneumonia,* it has obtained considerable note from the

[1] Wood's Therap. p. 167.

writings of Drs. Osgood, Norwood, Cutter, and many other American physicians. The plan recommended by Dr. Norwood is to commence with gutt. viij. of the tincture, repeated every third hour, with the addition of a drop to each successive dose, until the pulse is sufficiently reduced, or nausea supervenes; the dose to be subsequently regulated so as to sustain the depressed state of the circulation, with as little disturbance of the stomach as possible. Any excess of nausea may be controlled by a little morphine. The inflammatory symptoms decline with the reduction of the pulse, and the patient in due time enters into a very favourable convalescence. The experience of Dr. Kiemann,[1] of its remedial power in pneumonia, is strongly in its favour. He likewise employed it, with the same remarkable effect on the pulse, in *Valvular Disease of the Heart*, *Endocarditis*, *Pleurisy*, and *Bronchitis*. Dr. Waring-Curran[2] testifies to its value in *Pericarditis*. He prescribes an extract made by inspissating the juice of the root in doses of gr. ij. with gr. j. of calomel, in the form of pill, every two hours, and carefully watching its effects. Dr. C. Handfield Jones derived great advantage from it in the treatment of *Croup*. He gave ℥ij. of the tincture every hour.

2311. *In Acute Rheumatism*, it is said to possess great powers, when employed with a due regard to the necessity of depletion. It may often be advantageously associated with opiates, and should be given in small doses so as to obtain its sedative without its nauseating effect, and the quantity can be increased as the stomach is found to tolerate it. It is especially recommended by Dr. Osgood. *In Chronic Rheumatism*, it has also been extolled, but it is not so effectual as in the acute form. It is thought to be particularly adapted for the *Neuralgic forms of Rheumatism*. Benefit has been derived from it in various forms of *Neuralgia*, especially when occurring in gouty and rheumatic patients. *In Gout*, according to Dr. Tully, it is sufficient in the majority of cases to effect a cure. He considers it better adapted for the gout of feeble constitutions than colchicum, because less apt to weaken by exhausting operation on the bowels.

2312. *In Typhoid or Enteric Fever*, it is strongly recommended by Drs. Norwood, Branch, and others; but, as Stillé justly remarks, it is difficult to believe that a disease eminently specific in character, and most dangerous when its type is most asthenic, can be profitably treated by a medicine which tends so directly to produce such depression of the pulse, and ultimately collapse of the whole system. Prof. Wood regards this practice as "irrational." It must, however, be mentioned that some American authorities speak highly of the use of veratrine in typhoid. The general opinion among English pharmacologists seems rather adverse to its use.

2313. *In Obstinate Constipation*, the tincture, in doses of gutt. iij. four or five times daily, is reported to prove useful.

2314. The other diseases in which it is said to have been used

[1] Practitioner, Aug. 1868. [2] Practitioner, Aug. 1868.

with benefit are *Nervous Asthma, Dysentery, Puerperal Peritonitis, Aneurism, Palpitations of the Heart, and Jaundice.* Trustworthy evidence of its value in these affections, however, is still required. Prof. Wood employs veratrine viride in chronic cardiac diseases when there is excessive hypertrophy—*i.e.*, when digitalis is contra-indicated.

2315. Vienna Powder and Paste. A powerful caustic. It is composed of equal parts of quicklime and potassa c. calce. A piece of adhesive plaster, with a hole cut in it the size of the intended eschar, should be placed over the diseased part. The paste should be left on from five to fifteen minutes, according to the depth of the eschar required. It creates violent constitutional irritation, and is rarely employed at the present day.

2316. Warburg's Tincture. A preparation which has obtained considerable repute as a remedy in *Intermittent and Remittent Fevers.* The exact formula was published for Dr. Carl Warburg by Prof. Maclean.[1] It appears that quinine forms the principal ingredient. Warburg's tincture is a remedy of great power ; it is sold at a high price, in small bottles containing two doses. After the operation of an aperient, one dose is given, all drink is withheld, and in three hours the second dose is taken. Within a period from one to three hours profuse diaphoresis sets in, and this goes on until the bedding is saturated. In a great many cases there is no exacerbation after this sudorific action. So great is this action of the skin, and in some cases so exhausting, that the remedy used in the above manner would be highly dangerous in adynamic cases—a fact not adverted to in the printed directions which accompany each bottle. If used at all in such cases, it should be in much smaller quantities than those ordered, and support should be given as soon as the skin begins to act. Dr. Morehead speaks slightingly of this tincture ; not so Dr. Maclean (i. p. 80), whose remarks we here quote ; he expresses a high estimate of it, and recommends cautious trials to be made with it, for if given according to the printed directions, disastrous consequences may result.

Wourali Poison. (See Strychnos Toxifera.)

Yeast. (See Cerevisiæ Fermentum.)

2317. Zinci Acetas. Acetate of Zinc.

Med. Prop. and Action. Astringent, chiefly used in collyria and in injections. In its medicinal properties it resembles the sulphate. In doses of gr. j.–ij. it is tonic and antispasmodic ; gr. x.–xx. prove emetic, but it is rarely given internally.

2318. *Therapeutic Uses. In Gonorrhœa, Gleet, and Leucorrhœa,* unattended by inflammatory action, a solution of the acetate of zinc (gr. ij.–iv. ad Aq. ℥j.) forms a useful injection. Sir Astley

[1] Med. Times and Gaz. vol. ii. 1875, p. 541.

Cooper regarded the following formula as one of the best which could be employed :—℞ Zinci Sulph. gr. vj., Liq. Plumb. Diacet. ♏xxx., Aq. ʒiv. M. Ft. injectio. In this formula decomposition takes place, and the acetate of zinc results.

2319. *In the Ophthalmia of Children and Infants*, the same formula answers well, still further diluted, according to the severity of the case.

2320. Zinci Carbonas. Carbonate of Zinc. Calamine.

Med. Prop. and Action. Analogous, probably, to those of the Oxide (*q.v.*), but it is rarely administered internally. It is chiefly employed as an external application, either in powder or in the form of an ointment (ʒij. ad Ung. ʒx.). Native carbonate of zinc was introduced into the B. Ph. 1885, under the title of Calamina Præparata, and an ointment derived from it (Calamine 1 part, Benzoated Lard 5 parts).

Dose:—Gr. ij.-viij. in pill or powder. *For external use*, an ointment (*ante*).

2321. *Therapeutic Uses. In Burns, Scalds, Excoriations, Chapped Hands and Lips, Broken Chilblains, and Bed Sores*, the ointment (*ante*) is a very useful application. It should be spread smoothly on lint, and applied two or three times daily. *Weak and Indolent Ulcers* also improve and heal under its use. As a means of *preventing Pitting in Small-pox*, Prof. Bennett recommends, in preference to all other applications, the following ointment :—℞ Zinci Carb. ʒiij., Zinci Oxid. ʒj., Ol. Olivæ q.s. M. Dr. Gason, of Rome, succeeded in this object by dusting the whole surface thickly with powdered calamine; it was found also to have a very soothing effect.

2322. *In Skin Diseases.* Calamine in lotion or ointment is one of the most useful applications *for skin affections.* The lotion in the *weeping stage of Eczema* is most serviceable. As a dusting powder calamine is useful in *Intertrigo*, &c.

2323. Zinci Chloridum. Chloride of Zinc. Zinci Chloridi Liquor. Solution of Chloride of Zinc. It is popularly known as *Sir W. Burnett's Disinfecting Fluid.*

Med. Prop. and Action. The chloride is a powerful and penetrating escharotic. Its local action as a caustic depends partly on its affinity for albumen. As a ready mode of application, Mr. Weeden Cooke directs a piece of lint to be soaked in a solution of this salt, which, being very deliquescent, requires scarcely more than exposure to the air to render it liquid —at least a very few drops of water will quickly produce this effect. The lint, thoroughly soaked in the liquid, is hung up to dry for a short time, and will preserve its active properties for weeks if kept in a wooden or pasteboard box, such as a seidlitz-powder box. An old pair of scissors should be kept for cutting it, and forceps coated with vulcanite employed in its application or removal. The great convenience of this chloride of zinc lint is, that the smallest piece may be used, even to a wart or pimple, or to parts such as the eyelids, to which it would be almost impossible to apply the old paste. There is also the advantage of confining the caustic effect absolutely to the part to be attacked. For uterine purposes it is also much to be commended. Passed through a speculum to the diseased part, and covered by a further plug of dry lint, it does its work, if properly measured for the part to be destroyed, without injury to the healthy tissues. The solution is a valuable deodorizer,

but taken internally in an undiluted state it acts as a corrosive irritant poison. Given largely diluted, it is said to be a nervine tonic, but it is rarely administered, possessing no advantage over the milder zinc preparations. The chloride requires to be kept in well-stoppered bottles, as it rapidly deliquesces on exposure to the air.

Dose, gr. ss.-j. or ij., largely diluted.

2324. *Therapeutic Uses.* *In Cancer*, it is a valuable escharotic, but, like all other remedies of this class, it does nothing towards the eradication of the cancerous diathesis. The constitutional irritation to which it gives rise is a great objection to its use.

2325. *In Operative Surgery*, Mr. De Morgan introduced chloride of zinc *as a wound dressing*. A lotion (gr. xl. ad Aq. ℥j.) is a most effectual way of asepticizing a wound. It may either be washed over it from a glass syringe, or mopped with a sponge. It is a useful method to inject *foul sinuses*, with the view of a subsequent antiseptic treatment.

2326. *In Lupus*, the chloride has been employed by Cazenave and other French practitioners. *In stubborn Ulcers, with callous, hard, everted edges*, the chloride has been found to establish a healthier action, and rapidly to effect a cure.

2327. *In Gonorrhœa*, Mr. Lloyd speaks highly of the efficacy of injections of a solution of the chloride (gr. j. ad Aq. ℥j.). Half a small syringeful of this should be very gently injected every six or eight hours; saline aperients, warm fomentations, and strict antiphlogistic regimen should form the remainder of the treatment. In some chronic cases, the strength of the injection was gradually increased to gr. iij. in Aq. ℥j. Dr. Ringer reports highly of the injection every hour of a very weak solution (gr. j., Aq. Oj.), rest being at the same time strictly enjoined.

2328. *Gonorrhœal Ophthalmia*, both in children and in adults, has been successfully treated by Mr. Lloyd by a collyrium of chloride of zinc (gr. j. ad Aq. ℥j.). Mr. G. Lawson found a few drops of this collyrium, dropped into the eye twice daily, effectual in arresting the muco-purulent discharge remaining after the subsidence of *Purulent Ophthalmia*. Its value in these cases is further attested by Mr. J. Hutchinson, who employed a solution of greater strength (gr. ij.–iv., Aq. ℥j.). The weaker of these he states to be less painful than nitrate of silver, and may be used freely to the youngest infant. He mentions a case of threatened *Diphtheric Conjunctivitis*, in which it succeeded admirably. *In Pustular Ophthalmia*, he found it suit well where other astringents had done no good. "Often when nitrate of silver will do no more good, chloride of zinc will finish the cure, and *vice versa*."

2329. Zinci Oxidum. Oxide of Zinc.

Med. Prop. and Action. Tonic and antispasmodic. In large doses it causes vomiting, and sometimes purging; by gradually increasing the dose, however, very large quantities may be taken without producing any sensible effect. In commencing its use, care should be taken not to give it on an empty stomach, as it is apt to create nausea, and leave an unconquerable aversion to the remedy. (Waring-Curran.) Externally applied, it is an astringent. It may be used in

the form of ointment (gr. lxxx., Benzoated Lard ʒj.), or incorporated with glycerine (1 part to 4), or in fine powder.

Dose, gr. ij.–v. or x., in pill or powder.

2330. *Therapeutic Uses. In Spasmodic Asthma*, in doses of 2 grains and upwards twice or thrice daily it proves useful.

2331. *In Chorea*, the oxide proved very successful in the hands of Dr. Bedingfield, Dr. Crawford, and others, but it is inferior in efficacy to the sulphate. It should be commenced in small doses (gr. iij.–v.), and gradually increased till an impression is made on the disease. *In Epilepsy*, however, Dr. Russell Reynolds (ii. p. 280) regards the oxide as superior to the sulphate, and he states that the cases benefited by zinc were so by the former salt in doses of grs. iij.–v. thrice daily. It is very doubtful, however, whether zinc oxide is of any use in the treatment of *Epilepsy*.

2332. *In the Convulsions of Childhood*, it has also been used with benefit.

2333. *In Hooping Cough*, M. Guersant[1] recommends the oxide, in doses of gr. j.–iij. (according to the age of the child), in combination with equal parts of the extract of hemlock or belladonna.

2334. *In Chronic Alcoholic Intoxication*, the oxide, according to Dr. Marcet, is the proper remedy for the nervous symptoms which so often exist. It is necessary for the patient to abandon drinking his usual stimulants, and to take oxide of zinc (gr. ij.) twice daily, in the form of powder, an hour after each meal. The dose may be increased in the ratio of gr. ij. every third day, until the patient takes gr. vj.–viij. twice daily. Dr. Anstie's trials with this remedy were not satisfactory; he considers that, in the majority of cases, quinine acts much more satisfactorily. In certain subjects, especially the anæmic and the chlorotic, its continued administration produces a prejudicially depressing effect on the constitution. *In Delirium Tremens*, the oxide, according to Dr. Waring-Curran, is of essential benefit in strengthening the nervous system. He mentions a case in which it seemed to ward off the ill effects of indulgence in stimulant beverages. *In Nervous Irritability and Depression*, resulting from other causes than alcohol, as anxiety, over-study, &c., the oxide often appears to produce excellent effects, both as a tonic and as a sedative.

2335. *In Hysteria*, Dr. Waring-Curran regards the oxide as more reliable and efficacious than the valerianate.

2336. *In Gonorrhœa and Leucorrhœa*, Somme[2] successfully employed an injection of a solution of the oxide (ʒss., Aq. Oij.). *In Gleet*, Dr. Waring-Curran speaks favourably of the oxide; he states that under its use the mucous membrane soon takes on a healthy action. *In Spermatorrhœa*, he also found great benefit from it administered during the day, with camphor and conium at bedtime.

2337. *In Phthisis*, according to Dr. Waring-Curran, the oxide is of great value, especially in the earlier stages, steadying the

[1] Med. Times, vol. xvi. p. 575. [2] Archiv. Gén. de Méd. vol. i. p. 846.

nervous system, and acting as a general sedative. In the later stages it proves most useful in checking the *profuse sweating and colliquative diarrhœa*. Dr. Murrell[1] recommends gr. v.–x., in pill, to be made up with henbane or conium, and taken at bedtime.

2338. *In the Intermittent Fevers* of Barbadoes, Dr. Hendy found the oxide, in doses of gr. ij.–v., effectual even when cinchonine and other remedies had previously failed. Sir Gilbert Blane[2] bore similar testimony to its value.

2339. *Chronic Diarrhœa and Dysentery* occasionally yield to the oxide in doses of gr. iij.–v., thrice daily, when other metallic tonics and astringents fail.

2340. *In the Chronic stages of Purulent Gonorrhœal and Scrofulous Ophthalmia and in Ophthalmia Tarsi*, the oxide of zinc ointment is a very useful application, often producing speedy and permanent benefit. It should be applied to the lids with the finger or a camel-hair brush.

2341. *To Sore and Fissured Nipples*, the local application of a powder, composed of 1 part of oxide of zinc and 2 of powdered gum acacia, has been found serviceable. It forms a thin crust over the affected surface, which, being thus protected, speedily heals. *To Bed Sores, Excoriations, &c.*, zinc ointment is a good and efficient application.

2342. *In Scrofulous Coryza and Ozœna*, the local application of the ointment is very serviceable. Dr. Willshire directed that it should be introduced into the nasal cavity, by means of a camel-hair brush, every night and morning. The patient should be put, at the same time, under a course of iodine, quinine, or iron, and the bowels regulated by rhubarb and soda. In these cases the glycerine of oxide of zinc is, as a general rule, preferable to the ointment. It is more easily applied, and produces less irritation.

2343. *In Skin Diseases*, the ointment or glycerine of oxide of zinc is one of the most generally useful applications to which we can resort. Of the value of the ointment in *Eczema*, Sir E. Wilson speaks in the highest terms. Others, as Dr. T. McCall Anderson, prefer the glycerine of oxide of zinc, and in each case the efficacy of the application is increased by the addition of a little camphor. Its use is not confined to eczema, but may be resorted to with confidence in *Porrigo Larvalis, Porrigo Furfurans, Ecthyma, Erythema, Lichen Agrius, Sycosis, Impetigo, Ichthyosis, Crusta Lactea, Lepra, and Psoriasis. For allaying the local irritation, &c., consequent on Vaccination*, nothing generally answers better than oxide of zinc in fine powder, dusted over the surface, or in the form of ointment.

2344. Zinci Sulphas. Sulphate of Zinc.

Med. Prop. and Action. Tonic, astringent, and antispasmodic, in doses of gr. j., gradually increased. In doses of gr. x.–xx., it proves emetic, acting promptly and effectually, and leaving little subsequent depression; it is consequently much used in cases of poisoning by narcotic substances. Besides its

[1] Practitioner, vol. xxiii. p. 91.

[2] Med.-Chir. Trans. vol. iii.

tonic and astringent properties, which are evident only when persevered in in small and repeated doses, it appears to act powerfully as a nervine, and proves highly serviceable in spasmodic affections having their origin in derangement of the nerves or nervous centres (see *Chorea*). In excessive doses it is an irritant poison. Externally, it is an astringent and stimulant.

Dose:—As a tonic, gr. ij., gradually increased to gr. v., or more; *as an emetic*, gr. x.–xxx.

2345. *Therapeutic Uses. In Chorea*, the value of the sulphate of zinc has been shown by repeated clinical observations. The bowels should be acted upon, and then the zinc sulphate should be commenced in doses of gr. j., for a child æt. twelve years, and this should be increased by the addition of gr. j. to each dose daily, until it either causes sickness, or there is an obvious diminution of the choreal movements. In the former case the dose should be diminished by at least one-half, and so continued for several days with the view of establishing a tolerance; but if, on the other hand, there be marked improvement, it should be no further increased, but continued without alteration until either the improvement ceases—in which case it should be again gradually increased—or the disease has altogether subsided. When the latter is the case, the dose should be diminished day by day, rather than discontinued suddenly, as by following the former course we have less reason to dread a relapse. When anæmia is present, iron has more control over the disease than zinc.

2346. *In Epilepsy*, it has also been found successful, although not so uniformly as in chorea. It is a remedy of long-standing repute, but is generally inferior to the valerianate and oxide. It should be commenced in small doses, gradually increased in the manner advised in the last section.

2347. *In Hysteria* depending upon debility, sulphate of zinc will be found to agree with many females better than the preparations of iron, causing less irritation. One grain, combined with extract of gentian, may be given twice or thrice daily.

2348. *In Angina Pectoris*, the salts of zinc, particularly the sulphate, have sometimes proved successful when persevered in during the intermissions. *In Spasmodic Asthma*, it has also appeared, when its use is continued, to diminish the frequency and force of the attacks. Dr. Copland stated that he derived great benefit from it in *Asthma and in Hooping Cough*. In the last-named disease, Dr. Fuller obtained the best results from a combination of the sulphate and belladonna. To a child æt. three years, he prescribes gr. $\frac{1}{6}$ of Ext. Belladon. and gr. ss. of Zinci Sulph. four times daily. Above that age, gr. $\frac{1}{4}$ of belladonna and gr. j. of the sulphate.

2349. *In Phthisis*, for controlling the *night sweats*, Dr. Barlow considered that there is no remedy equal to the following combination:—℞ Zinci Sulph. gr. j., Ext. Hyoscyam. gr. iv. M. Ft. pil. h. s. s. *In Chronic Bronchitis*, for moderating the cough and expectorations, he recommended (p. 202) the following pill:—℞ Zinci Sulph. gr. j., Ext. Conii gr. iv. M. To be taken twice or thrice daily.

He also speaks favourably (p. 352) of zinc in *Valvular (Mitral) Disease of the Heart*:—℞ Zinci Sulph. gr. iij., Ext. Lupuli gr. vi. M. To make six pills, of which one is to be taken three times a day. The dose of the zinc should be gradually raised to gr. iij. When there is much palpitation, he advises its combination with camphor:—℞ Zinci Sulph. gr. j.–iij., Camphoræ gr. j., Ext. Hyoscyam. gr. ij. M. Ft. pil. to be taken thrice daily. When there is much irritability of the stomach the oxide should be substituted for the sulphate.

2350. *In Intermittent Fevers*, sulphate of zinc has occasionally been used with success. Dr. Brown ranks zinc next in value to arsenic as an antiperiodic. Sir J. M'Grigor gave it to the soldiers in the Peninsular War, to the extent of ʒss. daily, with success. *In Typhoid Fever*, Dr. Heer speaks of the undoubtedly beneficial action of the sulphate, especially in allaying the nervous agitation: —℞ Zinci Sulph. gr. viij., Aq. ℥viij. M. Dose, a tablespoonful every second hour.

2351. *In Menorrhagia*, Sir C. Locock considers that, in the atonic forms, sulphate of zinc is more easily managed than steel medicines, and that in many instances it proves more useful. Dose, gr. j.–ij., in the form of pill, thrice daily.

2352. *In Irritability of the Nervous System associated with Dyspepsia and Oxaluria*, the results of anxiety or exhaustion, the sulphate, first recommended by Dr. Golding Bird, often proves very serviceable. Dr. Wilson Fox observes that the sulphate, as well as the oxide, seems to act as a tonic in this condition, but the latter, he remarks, has the additional advantage, if given at bedtime in doses of gr. ij.–iij., of procuring sleep.

2353. *In Cynanche Tonsillaris*, when the abscess is so situated that it cannot be opened by the lancet, it has been proposed to administer an emetic; under the exertion caused by vomiting, the abscess will often burst, and discharge itself; for this purpose no emetic is better than the sulphate of zinc (gr. xx.). An emetic at the very outset of the disease often removes the symptoms altogether.

2354. *In Gangrene of the Mouth in Children*, the sulphate of zinc (gr. xx.) well incorporated with honey (ʒj.) is a very useful topical application.

2355. *In Ophthalmia Infantum*, a collyrium composed of Zinci Sulph. gr. j., Aq. ℥j.–ij. is very serviceable; in the ophthalmia of adults, it may be employed stronger (gr. j.–iv., Aq. ℥j.). The addition of liquor plumbi improves its efficacy.

2356. *In Gonorrhœa*, in the third stage, a very useful injection is a solution of the sulphate (gr. x., Aq. ℥viij.); liquor plumbi (ʒss.–j.) may be advantageously added. Prof. Sigmund regards it as more effectual than any other remedy. *In Leucorrhœa and Gleet*, the same injection may also be employed with advantage. *In Chronic Urethritis in the Female*, Dr. Braxton Hicks has successfully employed sulphate of zinc, cast in sticks, simply introduced into the urethra; he allows it to remain about five minutes

in the urethra. He has also employed the same measure in *Cervical Leucorrhœa.*

2357. *When Ulcers are attended with profuse discharge, or with loose, flabby granulations,* a solution of sulphate of zinc (gr. j.–v., Aq. ℥j.) forms a useful stimulant application.

2358. *In some Chronic Skin Diseases,* a solution is occasionally employed as a stimulating application. *In Acne Punctata vel Follicularis,* the following mixture, recommended by Dr. A. T. Thomson, forms a useful adjunct to other treatment:—℞ Zinci Sulph. gr. xxiv., Liq. Potassæ ℥iij. M. Dose, gutt. xxx. in water, twice daily. *In Ringworm,* Sir E. Wilson advises a sulphate of zinc ointment (℥j., Cerat. ℥j.); and a similar ointment he found useful in *Ichthyosis. In Syphilitic Eruptions,* baths containing ℥ij. of the sulphate are well spoken of by Dr. Fricke. *In Eczema and other skin diseases attended with intense itching,* Mr. T. P. Johnston speaks highly of a solution of the sulphate (gr. v., Aq. ℥j.). He states that he has never found it fail to relieve the pruritus; the pain it first causes soon passes off.

2359. Zinci Sulphocarbolas. Sulphocarbolate of Zinc.

Med. Prop. and Action. Astringent, it is serviceable for its power of lessening morbid secretion from mucous surfaces. It occurs in colourless, transparent, tabular, efflorescent crystals which are soluble in twice their bulk of rectified spirit or water.

2360. *Therapeutic Uses. In Urethritis and Leucorrhœa* sulphocarbolate of zinc proves itself of great value. A solution of gr. ij.–iij. in an ounce of water should be injected into the urethra or vagina as the case may be, care being taken that the fluid is of a right temperature and effectually reaches the seat of trouble.

2361. Zinci Valerianas. Valerianate of Zinc.

Med. Prop. and Action. Nervine-tonic and antispasmodic; it is said also to act as an anthelmintic. It is best given in the form of pill with confection of roses, or suspended in a little mucilage.

Dose, gr. ss. increased to gr. iij., twice or thrice daily.

2362. *Therapeutic Uses. In Epilepsy,* the valerianate has been thought by some to possess greater efficacy than the other salts of zinc, but the point has not been satisfactorily established. It is without doubt a valuable preparation, especially when the disease partakes of an hysterical character. It should be commenced in small doses (gr. j.), and gradually increased as the stomach is able to bear it.

2363. *In Chorea,* it has also been employed; but it does not appear to be so effectual as the sulphate. Dr. Neligan recommends it in the ordinary *Convulsive Affections of Children.* Dr. Danet has recorded a severe case of *Hiccough* of fifteen days' duration cured by the valerianate (gr. ¾) with a small portion of extract of belladonna. *Hysterical Cough,* connected with arrest of the menstrual function, has been successfully treated by Prof. G. Harley with valerianate of zinc and the cold douche.

2364. *In Nervous Affections associated with Uterine Diseases*, Dr. Tilt advised the valerianate, in doses commencing at gr. j. twice or thrice daily, gradually increasing the dose and combining it with ext. of hyoscyamus (gr. ij.) or ext. of belladonna (gr. $\frac{1}{4}$).

2365. *In Neuralgia*, the valerianate occasionally affords great and permanent relief. It appears that its curative powers are confined to those cases in which the disease is purely nervous, and to those neuralgic affections which accompany uterine derangement.

2366. ZINGIBER. Ginger. The dried rhizome of Zingiber officinale, *Roscoe*.

Med. Prop. and Action. Stimulant and carminative. If the powdered root be snuffed up the nostrils, it causes sneezing and violent irritation; if chewed, it increases the flow of saliva; when taken into the stomach, it causes a sensation of warmth, and excites a general stimulating action in the system. The active principles are an acrid, volatile oil, and a soft acrid resin. It is a useful adjunct to strong purgatives, the violence of which it moderates. The tincture is a good form for internal use. Externally, it is employed as a stimulant and rubefacient, the powdered dry root being made into a plaster with hot water.

Dose:—Of Powdered Ginger, gr. x.–xx. *Of the Tincture*, ♏xv.–lx. *Of the Strong Tincture, Essence of Ginger*, ♏v.–xx. *Of the Syrup*, ʒj.–ij. *Of the Infusion*, Ind. Ph., ℥j.–iij.

2367. *Therapeutic Uses. In Flatulence, Colic, Spasmodic Affections, and in Gout in the Stomach*, the tincture, or infusion of ginger, with the addition of carb. of soda and aromatic spirit of ammonia, may often be administered with evident benefit. A ginger plaster placed over the epigastrium often relieves the pain in a remarkable manner.

2368. *Relaxation of the Uvula and Tonsils, Paralysis of the Tongue and Fauces, &c.* These states are sometimes much improved by the local stimulus of ginger, chewed so as to produce a copious flow of saliva.

2369. *In Chronic Rheumatism*, the infusion of ginger (gr. cxx.–ccxl. ad Aq. Ferv. ℥vj.), commonly called "Ginger Tea," is a popular domestic remedy.

APPENDIX.

The following substances, unnoticed in the preceding pages, have been introduced into the B. Ph. of 1885.

2370. ARGENTI ET POTASSII NITRAS. Nitrate of Silver and Potassium. Mitigated Caustic. Lapis Infernalis Nitratis.

Med. Prop. and Action. Prepared in white or greyish white cylindrical rods or cones, freely soluble in distilled water, sparingly so in rectified spirit. It consists of one part of nitrate of silver and two parts of nitrate of potassium fused together in platinum or porcelain capsules. The cones should be kept in carefully stoppered bottles, and should not be handled or wrapped in paper. Mitigated caustic is contained in the German and other Pharmacopœias, and has several advantages over the lunar caustic in common use; it is milder in its action and produces much less charring and destruction of tissue than nitrate of silver when employed alone.

2371. *Therapeutic Uses. As a mild caustic* this preparation is intended for use in all cases when a slight and superficial destruction only of tissue is desired. For cases in which it is indicated see ARGENTI NITRAS, p. 75. It is not employed internally.

2372. TOUGHENED NITRATE OF SILVER. Toughened Caustic.

Med. Prop. and Action. Consists of nitrate of potassium, five parts, and nitrate of silver, ninety-five parts. These are mixed before fusion. It is less brittle than common lunar caustic and almost as active. For surgical and ophthalmic practice, this toughened caustic is run into moulds and used in cases where caustic action is required. (See ARGENTI NITRAS.)

2373. ARSENII IODIDUM. Iodide of Arsenium, formerly known as Arsenici Iodidum. Iodide of Arsenic.

Med. Prop. and Action. Alterative, tonic in small doses, but an irritant poison in large ones. When given internally it is absorbed into the system, and is eliminated by the urine, saliva, and perspiration. It is a powerful remedy, and requires to be given with great caution. If a sixteenth or a twelfth of a grain be taken twice daily for some time, it produces perspirations with dryness of the throat. Headache and neuralgic pains are also sometimes caused. The dose given in the B. Ph, gr. $\frac{1}{30}$, must be gradually increased until the physiological action of the salt develops itself. Externally, it is used in the form of ointment (gr. ij.–iij., Lard ʒj.) It should never be applied to a large ulcerated surface. It occurs in the form of small orange-coloured crystals, soluble in water and rectified spirit.

Dose, gr. $\frac{1}{30}$.

2374. *Therapeutic Uses.* *In Cancer,* Dr. Walshe[1] regarded the iodide of arsenic as one of the most valuable remedies we possess; but it must not be looked upon as a curative agent. After extensive employment of it, Dr. Walshe has drawn the following conclusions on the subject:—

1. Given in doses of from $\frac{1}{16}$ to $\frac{1}{12}$ of a grain, twice a day, two hours after eating, the iodide of arsenic is well borne, and may be continued without risk for several months.

2. The system, generally, soon gives evidence of its action; unusual palpitation, with dryness of the fauces and of the alimentary canal, occur; sometimes slight headache is complained of; but this is rare; and I have known the most violent *periodic headache,* which had affected a lady for years, disappear while she was under the influence of this salt.

3. The pain of the tumour decreases in violence.

4. The growth of the tumour in some cases appears to be less rapid during the administration of the iodide of arsenic.

5. The general health improves, which doubtless explains the apparent improvement in the local manifestation of the disease.

2375. *In Diseases of the Skin.* *In Lupus,* Dr. Walshe recommended this iodide: he found many of his cases permanently benefited.

2376. *In Lepra, Psoriasis,* and *Impetigo.* This combination of iodine and arsenic has proved useful. Neligan employed the following formula:—℞ Liq. Arsenicalis ʒij; Potass. Iodid. ʒss; Syr. ʒij; Aquam ʒss. He ordered a teaspoonful or a dessert-spoonful to be taken thrice daily in water.

2377. In some cases *of Eczema* Dr. McCall Anderson has found the following mixture of service:—℞ Liq. Arsenicalis ♏lxxx., Potass. Iodid. gr. xvj., Iodi gr. iv., Syr. Aurant. Flor. fʒij. A teaspoonful should be taken in a wineglassful of water thrice daily. In *Tinea capitis* iodide of arsenic has been recommended as an internal remedy, but it seems very doubtful whether the arsenic if given alone would not give at least as beneficial results as when combined with the iodine. For further therapeutic uses see Liq. Arsenici et Hydrargyri Iodidi, p. 97.

2378. Bismuthi Citras. Citrate of Bismuth.

Med. Prop. and Action. A white powder containing two and a half per cent. of absorbed moisture. This salt possesses the merits of the nitrate of bismuth (*q.v.*), but it is a more manageable drug, owing to the fact that it is soluble in liq. ammoniæ.

Dose, gr. ij.–v.

2379. Bismuthi et Ammonii Citras. Citrate of Bismuth and Ammonium.

Med. Prop. and Action. The above remarks apply also to this salt. The citrate of bismuth and ammonium occurs in small shining, translucent scales of a slightly metallic lustre. It is very soluble in water.

Dose, gr. ij.–v.

[1] On Cancer, pp. 201-2.

2380. *Therapeutic Uses.* These are for both the simple and compound citrate the same as those treated under Liq. Bismuthi et Ammoniæ Citras. (See p. 119.)

2381. CIMICIFUGÆ RHIZOMA, the dried rhizome and rootlets of Cimicifugæ racemosa, *Elliott* (Actæa racemosa, *Linn.*). Black Snake Root.

Med. Prop. and Action. The rhizome from its bitterness has been deemed tonic, and from its popular use in chest affections expectorant, but its proper place has been demonstrated by careful researches to be amongst the arterial and nervous sedatives. Cimicifuga slows the heart but increases the force of its action. It has a marked effect in dimininishing the force and frequency of the pulse, arterial tension becomes raised. These effects last for a considerable time. In large doses it produces vertigo, impaired vision with dilated pupils, nausea and vomiting with marked reduction of the pulse. By some it has been regarded as presenting a striking analogy to aconite; by others to colchicum. It appears to exercise a special action on the uterus and its functions. Its action on the uterus would seem to be very similar to that of ergot, although less. Thus the contractions of the parturient uterus are made more powerful by it, and hence it hastens the expulsion of the child. Ergot differs, however, from actæa in producing a constant and continuous contraction of the uterus, while the natural movements of this organ are merely strengthened, but not prolonged, by actæa. This latter remedy, therefore, is said to endanger much less the life of the child, and the soft structures of the mother. For preventing after-pains, and for assisting the expulsion of the placenta, ergot, however, is preferable, on account of its more persistent action. Cimicifuga when fresh contains a strongly odorous volatile oil; tannin and gallic acid also exist in its roots. No active principle has been isolated from Cimicifuga, although at one time a resin, *Cimicifugin*, was described as existing. This body, however, has been shown to be simply an impure resin obtained by precipitation with water.

Cimicifuga was introduced into the B. Ph. of 1885, and two preparations Extractum Cimicifugæ Liquidum and Tinctura Cimicifugæ, made officinal.

Doses:—Of the Liquid Extract, ♏iij.-xxx. *Of the Tincture*, ♏xv.-xxx.

2382. *Therapeutic Uses. In Diseases of the Lungs. In Phthisis*, Cimicifuga possesses no curative action, it relieves cough, improves appetite and lessens intercurrent *bronchitis*, and so ameliorates the patient's general condition. In *Tuberculosis*, it proves useless. *In the Chronic Bronchitis and Coughs of old age*, it appears to be specially useful. Prof. G. B. Wood considers that it probably acts in these cases by allaying irritation through its sedative properties. In *Catarrh*, common *cold*, it proves very useful, and is valuable as an expectorant in bronchitis. Prof. Bartholow recommends the following formula. ℞ Extr. Cimicifugæ f℥ss., Tinct. Opii ʒj., Syr. Tolut. ʒxj. M. Sig. One teaspoonful every four hours.

2383. *In Acute Rheumatism*, it has been strongly recommended, but authorities differ. *In Chronic Rheumatism*, however, there is no question of its very great value. It must, however, be given after carefully discriminating between the cases, as it fails entirely in some, while it acts almost instantly in others. Nor is its employment to be restricted to female patients. Dr. Ringer (p. 309) found it most useful in *Rheumatoid Arthritis*, where the joints are enlarged and much stiffened; but he remarks that it does not suit all cases alike, but best those in which the pains are

worse at night. He found it also serviceable where the *Rheumatism can be traced to some previous derangement of the uterus or its functions.*

2384. *In Lumbago and Sciatica* it is often of signal service. Ringer has found benefit from its use in *Cramps* of the limbs, and in conditions *of Muscular Fatigue;* while Bartholow speaks in favourable terms of Cimicifuga in *Myalgia, Pleurodynia,* and similar conditions. *In Pleurodynia,* when associated with uterine mischief, it seldom fails to give immediate relief.

2385. *In various forms of Neuralgia* it proves useful, thus *Ovarian Neuralgia, Neuralgia of the Fifth Pair, Rheumatic and Nervous Headache,* especially when associated with menstrual irregularity, Cimicifuga will give relief.

2386. *In Chorea,* its powers have been extolled by many American physicians. It certainly cures some cases, while it is useless in others. The cases in which its use is most likely to prove serviceable are those occurring in young women about the age of puberty, and more especially when uterine or ovarian irritation exists. Thus, as pointed out by Dr. Bartholow, these cases must be carefully investigated, and when menstrual irregularity is found to exist this drug is indicated. Dr. Ringer, however, found it successful only in those cases which were of rheumatic origin, and even in these it was not always effectual. He regards it as greatly inferior to arsenic.

2387. *In Uterine Affections.* Dr. Morse[1] found it effectual in *Amenorrhœa;* and Dr. Ringer says it will certainly arrest *Menorrhagia,* though he regards it as inferior in this affection to bromide of potassium. *In Dysmenorrhœa, in Suppression of the Menstrual or Lochial Discharges,* it is also valuable, while it relieves the *Heat of Head, Flushings of the Face, Pain in the Head, Back and Limbs,* when occurring as the result of menstrual perversion. *In Subinvolution of the Uterus,* Bartholow has found it serviceable; he, however, considers it acts better when combined with ergot. As an oxytocic *in Labour* and for the relief of *After Pains,* Cimicifuga is less valuable than ergot.

2388. *In Spermatorrhœa and Nocturnal Emissions,* Dr. Morse advises its use, as giving tone to the nervous system, removing irritation, and procuring sound and refreshing sleep. Here again discrimination is needful. Bartholow, who esteems Cimicifuga as an active aphrodisiac, has employed it with most benefit when the erections have been feeble and easily excited. In physiological *spermatorrhœa* it is contra-indicated.

2389. *In Cynanche Maligna,* a decoction of the root is recommended by Dr. Ringer as an excellent gargle. The same authority has employed it with advantage in cases of chronic "*dry*" *Pharyngitis* in which the mucous membrane of the pharynx is quite dry and spotted over with inspissated mucus.

2390. *In Atonic Dyspepsia,* especially when *due to drunkenness,* and in *febrile* and *inflammatory* states this drug proves very useful.

[1] New York Med. Journ. vol. v. p. 70.

It is not, however, in any way equal to digitalis in its power of steadying the heart in fever, and is in every way inferior in this connection.

2391. Collodion Vesicans. Blistering Collodion. Consists of blistering fluid twenty parts, Pyroxylin one part.

Med. Prop. and Action. A convenient preparation for vesication. It was introduced into the B. Ph. of 1885. It represents the collodion cum cantharide of the U. S. Ph., and a similar preparation in the German Pharmacopœia. In physical properties it resembles flexible collodion (*q.v.*), except in its dark colour.

Therapeutic Uses. See Cantharis, p. 142.

2392. Cupri Nitras. Nitrate of Copper. A salt obtained by dissolving copper in nitric acid.

Med. Prop. and Action. A strong corrosive body, mainly of service as a caustic. It occurs in large blue crystals, which are highly deliquescent and caustic. It is employed only externally.

2393. Elaterinum Elaterin. The active principle of Elaterium.

Med. Prop. and Action. A powerful hydragogue, purgative, and cathartic. It is obtained by exhausting elaterium with chloroform, adding ether to the solution, then collecting the precipitate. This is washed with ether, and purified by re-crystallisation from chloroform. As it is far more active than elaterium it must be given with caution, especially to the enfeebled, to the aged, and to children. Excessive doses produce gastro-enteritis.

Dose, gr. $\frac{1}{40}$–$\frac{1}{10}$.

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